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WPP 001/4 KHD 27,5 b1 1. Edition

E

PE12P100 A 920/5 RS 90 RSUV 300-600 P8/322 R Komb.-Nr. 0 401 870 039 1-10-5-7-2-11-6-8-3-12-4-9 je 30° -0,5° (-0,75) Note VDT-I-401/ 103

company engine KHD

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

### A. Fuel Injection Pump, Settings

Port closing at prestroke

(1,95-2,15)

mm (from BDC)

| Rotational<br>speed<br>rev/min<br>1 | Control rod travel         | Fuel delivery<br>cm <sup>1/100</sup> strokes<br>3 | Difference<br>cm <sup>-/</sup><br>100 strokes<br>4 | Control rod<br>travel<br>mm<br>2 | Fuel delivery<br>cm //100 strokes<br>3 | Spring pre-tensioning<br>(torque control valve)<br>mm<br>6 |
|-------------------------------------|----------------------------|---|--|----------------------------------|--|--|
| 1000                                | 12,0                       | 12,4-13,2   | 0,5  |                                  |  |  |
| 600<br>600<br>600<br>200            | 9,0<br>12,0<br>15,0<br>9,0 | 5,4-6,4<br>11,4-12,7<br>17,5-18,8<br>3,6-4,6      |  |                                  |  |  |

Adjust the fuel delivery from each outlet according to the values in

### **B. Governor Settings**

| 1     | rated speed<br>Control rod<br>travel<br>mm |                              | Intermed | diate rated | speed  | Control-<br>lever<br>deflection<br>in degrees<br>7 | Lower<br>rev/min<br>8 | rated speed<br>  Control rod<br>  travel<br>  mm<br>  9 | 3 To<br>rev/min<br>10 | rque control<br>Control rod<br>travel<br>mm |
|-------|--|------------------------------|----------|-------------|--------|--|-----------------------|---|-----------------------|---|
| ca.68 | 600<br>620<br>635                          | 16,0<br>10,4<br>6.0          | witho    | out aux     | xiliar | ca.34<br>y spring                                  | 300<br>60<br>300      | 8,0<br>19-21<br>7,7-8,3                                 | 580<br>350<br>320     | 0   |
| 29    | 620<br>650<br>690                          | 9,0-10,6<br>2,0-4,8<br>0-1,0 | with     | auxil       | iary s | pring  | 320<br>360            | 4,5-6,3<br>0 - 1,0                                      |                       |   |

The numbers denote the sequence of the tests

## C. Settings for Fuel Injection Pump with Fitted Governor

| Test of to | emp 40°C-(104°F)<br>cm*/1000 strokes | Rotational-<br>speed limitat<br>Note<br>changed to 1<br>rev/min | et delivery<br>aracteristics<br>cm <sup>3</sup> /1000 strokes | Starting fi<br>Idle<br>rev/min<br>6 | cm <sup>1</sup> /1000 strokes | • | Control rod<br>travel<br>mm |
|------------|--------------------------------------|---|---|-------------------------------------|-------------------------------|---|-----------------------------|
| Take       | from VDT-1-401/                      | 103   |   | -                                   |                               | - | -                           |

Checking values in brackets

\* 1 mm less control rod travel than col 2

6.84

**BOSCH** 

Geschaftsbereich KH. Kundendienst. Kfz-Ausrustung. < 1980 by Robert Bosch GmbH, Postfach 50, D-7000 Stuttgart 1: Printed in the F#Jeral Republic of Germany tmprimé en République Fédérale d'Allemagne par Robert Bosch GmbH.

WPP 001/4 KHD 27,5 b 2. Edition

PE12 P 100/920/5 RS 90 Komb.-Nr. 0 401 870 023 RSUV 300-600 P8/322 R

supersedes 6.70 KHD company

1-10-5-7-2-11-6-8-3-12-4-9 je  $30^{\circ} \stackrel{+}{-}0,5^{\circ} (\stackrel{+}{-}0,75^{\circ})$ 

F12 M 716 engine

Note VDT-I-401/ 103

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

# A. Fuel Injection Pump Settings

Port closing at prestroke

90mg 00 4mg

(1.95-2.15)

mm (from BDC)

| Rotational<br>speed<br>rev/min  | Control rod<br>travel<br>mm 2 | Fuel delivery<br>cm '/100 strokes<br>3       | Difference<br>cm <sup>-y</sup><br>100 strokes<br>4 | Control rod<br>travel<br>mm<br>2 | Fuel delivery<br>cm '/100 strokes<br>3 | Spring pre-tensioning<br>(torque-control valve)<br>mm<br>6 |
|---------------------------------|-------------------------------|--|--|----------------------------------|--|--|
| 600<br>600<br>600<br>600<br>200 | 9,0<br>12,0<br>15,0<br>9,0    | 5,4-6,4<br>11,4-12,7<br>17,5-18,8<br>3,6-4,6 | 0,5  |                                  |  |  |

Adjust the fuel delivery from each outlet according to the values in

#### **B. Governor Settings**

| Degree of<br>deflection<br>of control<br>lever | r rated speed<br>Control rod<br>travel<br>mm | rev/min<br>Control rod<br>travel<br>rnm rev/min | Interme | diate rate       | d speed | Control-<br>lever<br>deflection<br>in degrees<br>7 | Lowe<br>rev/min<br>8 | cr rated speed<br>Control rod<br>travel<br>mm | 3 To              | rque control<br>  Control rod<br>  travel<br>  mm<br>  11 |
|--|--|---|---------|------------------|---------|--|----------------------|---|-------------------|---|
| ca.68  | 600<br>620<br>635                            | 16,0<br>10,4<br>6,0                             | with    | without auxiliar |         |  | 300<br>60<br>300     | 8,0<br>19-21<br>7,7-8,3                       | 580<br>350<br>320 | 0<br>0<br>1,2-1,8   |
| 20   | 620<br>650<br>690                            | 9,0-10,6<br>2,C-4,8<br>0-1,0                    | with    | auxil            | iary s  | pring  | 320<br>360           | 4,5-6,3<br>0 - 1,0                            |                   |   |

The numbers denote the sequence of the tests

# C. Settings for Fuel Injection Pump with Fitted Governor

|                        | ull load stop                             | 6 Rotational speed limitat           |         | uel delivery<br>paracteristics | Starting f | uel delivery 5       | 4a Idle stop |              |  |
|------------------------|---|--------------------------------------|---------|--------------------------------|------------|----------------------|--------------|--------------|--|
| Test oil to<br>rev/min | emp 40°C (104 F)<br>cm /1000 strokes<br>2 | Note<br>changed to 1<br>rev/min<br>3 | rev/min | cm*/1000 strokes               | rev/min    | cm#1000 strokes<br>7 | rev/min<br>8 | travel<br>mm |  |
| Take                   | from VDT-I-401/                           | 103                                  |         |                                | -          | •                    | •            | -            |  |
|                        |   |                                      |         |                                |            |                      |              |              |  |
|                        |   |                                      |         |                                |            |                      |              |              |  |

Checking values in brackets

\* 1 mm less control rod travel than col 2

6.84

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WPP 001/4 KHD 27,5 c

1. Edition

PE12P100/920/5 RS 90 RSUV 300-750P9/322 R

Kont.-Nr. 0 401 870 024

1-10-5-7-2-11-6-8-3-12-4-9 je 30° ±0,5° (±0,75°)

supersedes KHD company F12 M716 engine

Note VDT-I-401/ 103

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

# A. Fuel Injection Pump Settings

Port closing at prestroke

Testoil-ISO 4113

(1.95-2.15)

mm (from BDC)

| Rotational<br>speed<br>rev/min<br>1 | Control rod<br>travel<br>mm 2 | Fuel delivery<br>cm /100 strokes<br>3        | Difference<br>cm <sup>17</sup><br>100 strokes<br>4 | Control rod<br>travel<br>mm<br>2 | Fuel delivery<br>cm //100 strokes<br>3 | Spring pre-tensioning<br>(torque-control valve)<br>mm<br>6 |
|-------------------------------------|-------------------------------|--|--|----------------------------------|--|--|
| 1000                                | 12,0                          | 12,4-13,2                                    | 0,5  |                                  |  |  |
| 600<br>600<br>600<br>200            | 9,0<br>12,0<br>15,0<br>9,0    | 5,4-6,4<br>11,4-12,7<br>17,5-18,8<br>3,6-4,6 |  |                                  | 4                                      |  |

Adjust the fuel delivery from each outlet according to the values in

#### **B. Governor Settings**

| Degree of deflection | rated speed<br>Control rod<br>travel<br>mm | rev/min Control rod travel mm rev/min | Intermed         | liate rated | speed  | Control-<br>lever<br>deflection<br>in degrees<br>7 |                    | rated speed<br> Control rod<br> travel<br> mm<br> 9 | (3)               | rque control<br>Control rod<br>travel<br>mm |
|----------------------|--|---------------------------------------|------------------|-------------|--------|--|--------------------|---|-------------------|---|
| ca.68                | 750<br>770<br>800                          | 16,0<br>12,5<br>6,2                   | witho            | ut aux      | kiliar | ca. 31<br>y spring                                 | 300<br>50<br>300   | 8,0<br>19-21<br>7,7-8,3                             | 730<br>450<br>340 | 0   |
| 29                   | 800  | 7,4-10,4<br>4,8-7,8<br>1,8-4,8        | with auxiliary s |             | pring  | 350<br>400   | 1,4-4,2<br>0 - 1,0 |   |                   |   |

The numbers denote the sequence of the tests

#### C. Settings for Fuel Injection Pump with Fitted Governor

| <b>W</b>               | ill-load stop                        | speed limitat Characteristics |         |                  | Starting f | uel delivery 5        |              |                             |  |
|------------------------|--------------------------------------|-------------------------------|---------|------------------|------------|-----------------------|--------------|-----------------------------|--|
| Test oil to<br>revimin | emp 40°C (104°F)<br>cm1/1000 strokes | Note changed to ) rev/min 3   | rev/min | cm³/1000 strokes | rev/min    | cm³/1000 strokes<br>7 | rev/min<br>8 | Control rod<br>travel<br>mm |  |
| Take                   | from VDT-I-401/                      | 103                           |         |                  | -          | -                     | -            | -                           |  |
|                        |                                      |                               |         |                  |            |                       |              |                             |  |

Checking values in brackets

\* 1 mm less control rod travel than col 2

6.84

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WPP 001/4 KHD 27,5 1. Edition

PE12 P100 A 920/5 RS 90 RSUV 300-750 P9/322 R

Komb.-Nr. 0 401 870 034

1-10-5-7-2-11-6-8-3-12-4-9 je 30° ±0,5° (±0,75°)

Note VDT-I-401/ 103

company KHD F12M716

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

## A. Fuel Injection Pump Settings

Port closing at prestroke

(1.95-2.15)

mm (from BDC)

| Rotational<br>speed<br>rev/min<br>1 | Control rod travel mm 2    | Fuel delivery cm/100 strokes 3               | Difference<br>cm <sup>-/</sup><br>100 strokes<br>4 | Control rod<br>travel<br>mm<br>2 | Fuel delivery<br>cm <sup>-/</sup> 100 strokes<br>3 | Spring pre-tensioning<br>(torque-control valve)<br>mm |
|-------------------------------------|----------------------------|--|--|----------------------------------|--|---|
| 1006                                | 12,6                       | 12,4-13,2                                    | 0,5  |                                  |  |   |
| 600<br>600<br>600<br>200            | 9,0<br>12,0<br>15,0<br>9,0 | 5,4-6,4<br>11,4-12,7<br>17,5-18,8<br>3,6-4,6 |  |                                  |  |   |

Adjust the fuel delivery from each outlet according to the values in

#### **B.** Governor Settings

| 1     | rated speed<br>Control rod<br>travet<br>mm |                                 | Intermed | hate rated | speed<br>6 | Control-<br>fever<br>deflection<br>in degrees<br>7 |                         | rated speed<br>Control rod<br>travel<br>mm | (0)               | rque control<br>Control rod<br>travel<br>mm |
|-------|--|---------------------------------|----------|------------|------------|--|-------------------------|--|-------------------|---|
| ca.68 | 750<br>770<br>800<br>785                   | 16,0<br>12,5<br>6,2<br>7,4-10,4 | witho    | ut aux     | (iliar     | ca.31<br>y spring                                  | 300<br>50<br>300<br>350 | 8,0<br>19-21<br>7,7-8,3<br>1,4-4,2         | 730<br>450<br>340 | 0<br>0<br>1,2-1,8                           |
| 29    | 800<br>820                                 | 1 8-7 B                         | with     | auxili     | iary s     | pring  | 400                     | 0 - 1,0                                    |                   |   |

The numbers denote the sequence of the tests

## C. Settings for Fuel Injection Pump with Fitted Governor

| 2b Fu    | il-load stop                              | Rotational- speed limitat             | 3a Fuel delivery characteristics |                                       | Starting f | uel delivery 5                     | 4a Idle stop |                                  |
|----------|---|---------------------------------------|----------------------------------|---------------------------------------|------------|------------------------------------|--------------|----------------------------------|
| rev/min  | emp 40°C (104°F)<br>cm³/1000 strokes<br>2 | Note.<br>changed to )<br>rev/min<br>3 | rev/min                          | cm <sup>3</sup> /1 <b>000</b> strokes | rev/min    | cm <sup>3</sup> /1000 strokes<br>7 | rev/min<br>8 | Control rod<br>travel<br>mm<br>9 |
| Take     | from VDT-I-401/                           | 103                                   |                                  |                                       | -          | -                                  | -            | -                                |
| <b>S</b> |   |                                       |                                  |                                       |            |                                    |              |                                  |
|          |   |                                       | ļ                                |                                       |            |                                    |              |                                  |

Checking values in brackets

\* 1 mm less control rod travel than col 2

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WPP 001/4 KHD 27,5 e 1. Edition

En

PE12P110/920/5 RS 90 RSUV 300-750P9/322 R 1-10-5-7-2-11-6-8-3-12-4-9 je 30° -0,5° (-0,75°) Values only apply to test nozzle-and-holder assembly 0 681 443 022 and fuel-injection test tubing 1 680 750 060 Note VDT-I-401/103

supersedes KHD
company BF12 M 716
engine

iomb.-Nr. 0 401 870 026

All test specifications are valid for Brisch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke (1

(1,95-2,15)

mm (from BDC)

| Rotational<br>speed      | Control rod<br>travel      | Fuel delivery                                | Difference  | Control rod travel | Fuel delivery   | Spring pre tensioning<br>(torque-control valve) |
|--------------------------|----------------------------|--|-------------|--------------------|-----------------|---|
| rev/min<br>1             | mm <b>2</b>                | cm·/100 strokes                              | 100 strokes | mm<br>2            | cm·/100 strokes | mm<br>6   |
| 1000                     | 12,0                       | 18,8-19,6                                    | 0,8         |                    |                 |   |
| 600<br>600<br>600<br>200 | 6,0<br>12,0<br>15,0<br>6,0 | 3,4-4,4<br>18,2-19,5<br>26,7-28,4<br>0,9-1,9 |             |                    |                 |   |

Adjust the fuel delivery from each outlet according to the values in

#### **B. Governor Settings**

| Degree of deflection of control lever | crated speed<br>Control rod<br>travel<br>mm | Control rod<br>travel<br>mm rev/min | Interme | diate rated | speed  | Control-<br>lever<br>deflection<br>in degrees<br>7 | Lower<br>rev/min<br>8 | rated speed<br>Control rod<br>travel<br>mm | ハッノ               | rque control<br>Control rod<br>travel<br>mm |
|---------------------------------------|---|-------------------------------------|---------|-------------|--------|--|-----------------------|--|-------------------|---|
| ca.68                                 | 750<br>770<br>800                           | 16,0<br>12,5<br>6,2                 | with    | out au      | xiliar | ca.31<br>y spring                                  |                       | 8,0<br>19-21<br>7,7-8,3                    | 730<br>400<br>320 | 0<br>0<br>1,2-1,8                           |
| 29                                    | 785<br>800<br>820                           | 7,4-10,4<br>4,8-7,8<br>1,8-4,8      | with    | auxil       | iary s | pring  | 350<br>400            | 1,4-4,2<br>0 -1,0                          |                   | -   |

The numbers denote the sequence of the tests

### C. Settings for Fuel Injection Pump with Fitted Governor

| <b>2b</b> <sup>Fu</sup> | II load stop                              | 6 Rotational speed limitat  | 39 F.   | Fuel delivery characteristics |         | Starting fuel delivery 5           |         | 4a) Idle stop               |  |
|-------------------------|---|-----------------------------|---------|-------------------------------|---------|------------------------------------|---------|-----------------------------|--|
| rev/min                 | emp 40°C (104 F)<br>cm*/1000 strokes<br>2 | Note changed to 1 rev/min 3 | rev/min | cmi/1000 strakes<br>5         | rev/min | cm <sup>1</sup> /1000 strokes<br>7 | rev/min | Control rod<br>travel<br>mm |  |
| Take                    | from VDT-I-401/                           | 103                         |         |                               | -       | •                                  | -       | -                           |  |
|                         |   |                             |         |                               |         |                                    |         |                             |  |
|                         |   |                             |         |                               |         |                                    |         |                             |  |

Checking values in brackets

\* 1 mm less control rod travel than col 2

6.84

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WPP 001/4 KHD 27.5 d

1. Edition

En

PE12P100/920/5 R\$ 90 R\$UV 300-1000 P0/323 R Komb.-Nr. 0 401 870 025 1-10-5-7-2-11-6-8-3-12-4-9 je 30° <sup>±</sup>0,5° (<sup>±</sup>0,75)

supersedes Company F12M716

Note VDT-I-401/ 103

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

## A. Fuel Injection Pump Settings

Port closing at prestroke

2,0-2,1 (1,95-2,15)

mm (from BDC)

| Rotational<br>speed<br>rev/min | Control rod<br>travel<br>mm 2 | Fuel delivery<br>cm·/100 strokes<br>3        | Oifference<br>cm <sup>-y</sup><br>100 strokes<br>4 | Control rod<br>travel<br>mm<br>2 | Fuel delivery<br>cm <sup>1</sup> /100 strokes<br>3 | Spring pre-tensioning<br>(torque-control valve)<br>mm<br>6 |
|--------------------------------|-------------------------------|--|--|----------------------------------|--|--|
| 1000                           | 12,0                          | 12,4-13,2                                    | 0,5  |                                  |  |  |
| 600<br>600<br>600<br>200       | 9,0<br>12,0<br>15,0<br>9,0    | 5,4-6,4<br>11,4-12,7<br>17,5-18,8<br>3,6-4,6 |  |                                  |  |  |

Adjust the fuel delivery from each outlet according to the values in

#### **B. Governor Settings**

| Uppe<br>Degree of<br>deflection<br>of control<br>lever | r rated speed<br>Control rod<br>travel<br>mm | rev/min<br>Control rod<br>travel<br>mm rev/min | Intermed | diate rated | speed 6 | Control-<br>lever<br>deflection<br>in degrees<br>7 | Lower<br>rev/min<br>8 | rated speed<br>Control rod<br>travel<br>mm | ( )               | rque control<br> Control rod<br> travel<br> mm<br>  11 |
|--|--|--|----------|-------------|---------|--|-----------------------|--|-------------------|--|
| ca.56  | 1000<br>1030<br>1055                         | 16,0<br>10,8<br>6.0                            | witho    | out aux     | kiliar  | ca.18<br>y spring                                  | 300<br>50<br>300      | 8,0<br>19-21<br>7,7-8,3                    | 980<br>430<br>340 | 0<br>0<br>1,2-1,8                                      |
| 29   | 1030<br>1055<br>1200                         | 10,0-12,0<br>3,8-6,0<br>0 - 1,0                | with     | auxil       | iary s  | pring  | 350<br>500            | 4,4-6,0<br>0 - 1,0                         |                   |  |

the numbers denote the sequence of the tests

## C. Settings for Fuel Injection Pump with Fitted Governor

| 9                           | ill-load stop                        | 6 Rotational-<br>speed limitat |         | uel delivery<br>naracteristics | Starting fuel delivery 5 |                  |         |                              |  |  |
|-----------------------------|--------------------------------------|--------------------------------|---------|--------------------------------|--------------------------|------------------|---------|------------------------------|--|--|
| Test oil te<br>rev/min<br>1 | emp 40°C (104°F)<br>cm*/1000 strokes | Note changed to 1 rev/min 3    | rey/min | cm <sup>4</sup> /1000 strokes  | rev/min                  | cm /1000 strokes | rev/min | Control root<br>travel<br>mm |  |  |
| Take                        | from VDT-I-401/                      | 03                             |         |                                | -                        | -                | -       | -                            |  |  |
|                             |                                      |                                |         |                                |                          |                  |         |                              |  |  |

Checking values in brackets

\* 1 mm less control rod travel than col 2

6.84

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Geschaftsbereich KM. Kundendienst. Kfz-Ausrustung. c. 1980 by Robert Bosch GmbH. Postfach 50. D-7000 Stuttgart 1. Printed in the Federal Republic of Germany Imprimé en République Fédérale d'Allemagne par Robert Bosch GmbH.

WPP 001/4 KHD 27,5 d1 1. Edition

PE12P 100 A 920/5 RS 90

RSUV 300-1000 P0/323 R

supersedes" KHD company

Komb.-Nr. 0 401 870 035

1-10-5-7-2-11-6-8-3-12-4-9 je 30° ±0,5° (±0,75°)

F12M716 engine

Note VDT-I-401/ 103

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

## A. Fuel Injection Pump Settings

Port closing at prestroke (1,95-2,15)

**Testoil-ISO 4113** 

mm (from BDC)

| Rotational speed rev/min | Control rod<br>travel<br>mm 2 | Fuel delivery<br>cm/100 strokes<br>3 | Difference<br>cm <sup>-/</sup><br>100 strokes<br>4 | Control rod<br>travel<br>mm<br>2 | Fuel delivery<br>cm-7100 strokes<br>3 | Spring pre-tensioning<br>(torque-control valve)<br>mm<br>6 |
|--------------------------|-------------------------------|--------------------------------------|--|----------------------------------|---------------------------------------|--|
| 1000                     | 12,0                          | 12,4-13,2                            | 0,5  |                                  |                                       |  |
| 600<br>600<br>600<br>200 | 9,0<br>12,0<br>15,0<br>9,0    | 5,4-6,4<br>11,4-12,7<br>17,5-18,8    |  |                                  |                                       |  |

Adjust the fuel delivery from each outlet according to the values in

#### **B. Governor Settings**

|       | rated speed<br>Control rod<br>travel<br>mm | rev/min Control rod travel mm rev/min | Intermed | fiate rated | speed  | Control-<br>lever<br>deflection<br>in degrees<br>7 |                  | rated speed<br>Control rod<br>travel<br>mm | 1 3 1             | rque control<br>Control rod<br>travel<br>mm |
|-------|--|---------------------------------------|----------|-------------|--------|--|------------------|--|-------------------|---|
| ca.56 | 1000<br>1030<br>1055                       | 16,0<br>10,8<br>6,0                   | witho    | out aux     | xiliar | ca.18<br>y spring                                  | 300<br>50<br>300 | 8,0<br>19-21<br>7,7-8,3                    | 980<br>430<br>340 | 0<br>0<br>1,2-1,8                           |
| 29    | 1030<br>1055<br>1200                       | 10,0-12,0<br>3,8-6,0<br>0- 1,0        |          | auxil       | iary s | pring  | 350<br>500       | 4,4-6,0<br>0 -1,0                          |                   |   |

The numbers denote the sequence of the tests

# C. Settings for Fuel Injection Pump with Fitted Governor

|         | ill load stop    | Rotational speed limitat | 3a Fuel delivery characteristics |                  | Starting fuel delivery 5 |                       | 4a Idle stop |                   |
|---------|------------------|--------------------------|----------------------------------|------------------|--------------------------|-----------------------|--------------|-------------------|
| rev/min | cm /1000 strokes | changed to 1 rev/min 3   | rev/min                          | cm·/1000 strokes | rev/min                  | cm v1000 strokes<br>7 | rev/min<br>B | travel<br>mm<br>9 |
| Take    | from VDT-I-401/  | 103                      |                                  |                  |                          |                       |              |                   |
|         |                  |                          |                                  |                  |                          |                       |              |                   |
|         |                  |                          |                                  |                  |                          |                       |              |                   |

Checking values in brackels

\* 1 mm less control rod travel than cot 2

6.84

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En

PE12P100/920/5 RS 90 RSU 300/1000 PO/331 R

omb.-Nr. 0 401 870 028 1-10-5-7-2-11-6-8-3-12-4-9 je 30° -0,5° (-0,75°) Note VDT-I-401/103 company KHD FR M 716

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

# A. Fuel Injection Pump Settings

Port closing at prestroke

(1,95-2,15)

mm (from BDC)

| Rotational<br>speed<br>rev/min<br>t | Control rod<br>travel<br>mm 2 | Fuel delivery<br>cm <sup>-/</sup> 100 strokes<br>3 | Difference<br>cm <sup>-/</sup><br>100 strokes<br>4 | Control rod<br>travel<br>mm<br>2 | Fuel delivery<br>cm /100 strokes<br>3 | Spring pre-tensioning<br>(torque-control valve)<br>mm<br>6 |
|-------------------------------------|-------------------------------|--|--|----------------------------------|---------------------------------------|--|
| 1000                                | 12,0                          | 12,4-13,2  | 0,5  |                                  |                                       |  |
| 600<br>600<br>600<br>200            | 9,0<br>12,0<br>15,0<br>9,0    | 5,4-6,4<br>11,4-12,7<br>17,5-18,8<br>3,6-4,6       |  |                                  |                                       |  |

Adjust the fuel delivery from each outlet according to the values in

#### **B.** Governor Settings

| 11 '  | rated speed<br>Control rod<br>travel<br>mm |                                  | liate rated | speed<br>6 | Control-<br>lever<br>deflection<br>in degrees<br>7 |                          | rated speed<br>Control rod<br>travel<br>mm<br>9 |                     | rque control<br>Control rod<br>travel<br>mm |
|-------|--|----------------------------------|-------------|------------|--|--------------------------|---|---------------------|---|
| ca.68 | 1000<br>.1050<br>1100                      | 15,8-16,2<br>8,8-10,2<br>3,4-5,2 | •           | •          | ca.34  | 300<br>100               | 7,3<br>19-21                                    | 980<br>500<br>0 300 | 0<br>0<br>1,7-2,3                           |
| 29    | 1150<br>1200                               | 0,9-3,0<br>0 - 2,0               |             |            |  | 200<br>300<br>350<br>450 | 10,0-15,<br>7,0-7,6<br>4,0-5,4<br>0 - 1,        |                     | 1,7-2,3                                     |

The numbers denote the sequence of the tests

## C. Settings for Fuel Injection Pump with Fitted Governor

| 2b) Fu                      | II load stop                               | 6 Rotational-<br>speed limitat       |              | uel delivery<br>paracteristics     | Starting f   | uel delivery 5        | 4a) Idle stop |                                  |
|-----------------------------|--|--------------------------------------|--------------|------------------------------------|--------------|-----------------------|---------------|----------------------------------|
| Test oil te<br>rev/min<br>1 | emp 40°C (104°F)<br>cm //1000 strokes<br>2 | Note<br>changed to )<br>rev/min<br>3 | rev/min<br>4 | cm <sup>1/</sup> 1000 strokes<br>5 | rev/min<br>6 | cm³/1000 strokes<br>7 | rev/min<br>8  | Control rod<br>travel<br>mm<br>9 |
| Take                        | from VDT-I-401/                            | 103                                  |              |                                    | -            | •                     | -             | -                                |
|                             |  |                                      |              |                                    |              |                       |               |                                  |
|                             |  |                                      |              |                                    |              |                       |               |                                  |

Checking values in brackets

\* 1 mm less control rod travel than col 2

6.84

BOSCH

WPP 001/4 KHD 27,5 f1 1. Edition

PE12F100A 920/5 RS 90 Komb.-Nr. 0 401 870 036 1-10-5-7-2-11-6-8-3-12-4-9 je 30° -0,5° (-0,75°)

RSU 300/1000 PO/331 R

supersedes company engine

KHD F12M 716

Note VDT-I-401/ 103

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

### A. Fuel Injection Pump Settings

Port closing at prestroke

,

2,0-2,1 (1,95-2,15)

mm (from BDC)

| Rotational<br>speed<br>rev/min<br>1 | Control rod<br>travel<br>mm 2 | Fuel delivery<br>cm <sup>1</sup> /100 strokes<br>3 | Difference<br>cm <sup>-y</sup><br>100 strakes<br>4 | Control rod<br>travel<br>mm<br>2 | Fuel delivery<br>cm <sup>-/</sup> 100 strokes<br>3 | Spring pre tensioning<br>(torque-control valve)<br>mm<br>6 |
|-------------------------------------|-------------------------------|--|--|----------------------------------|--|--|
| 1000                                | 12.0                          | 12,4-13,2  | 0,5  |                                  |  |  |
| 600<br>600<br>600<br>200            | 9,0<br>12,0<br>15,0<br>9,0    | 5,4-6,4<br>11,4-12,7<br>17,5-18,8<br>3,6-4,6       |  |                                  |  |  |

Adjust the fuel delivery from each outlet according to the values in

#### **B.** Governor Settings

|       | raled speed<br>Control rod<br>travel<br>mm |                                  | Intermed | diate rated | speed<br>6 | Control-<br>lever<br>deflection<br>in degrees<br>7 | Lower<br>rev/min<br>8 | rated speed<br>Control rod<br>travel<br>mm |                   | rque control<br> Control rod<br> travel<br> mm |
|-------|--|----------------------------------|----------|-------------|------------|--|-----------------------|--|-------------------|--|
| ca.68 | 1000<br>1050<br>1100                       | 15,8-16,2<br>8,8-10,2<br>3,4-5,2 |          | •           | •          | ca.34  | 300<br>100<br>200     | 7,3<br>19-21<br>10,0-15,                   | 980<br>500<br>300 | 0<br>0<br>1,7-2,3                              |
| 29    | 1150<br>1200                               | 0,9-3,0                          |          |             |            |  | 300<br>350<br>450     | 7,0-7,6<br>4,0-5,4<br>0-1,0                |                   | .,,.   |

The numbers denote the sequence of the tests

#### C. Settings for Fuel Injection Pump with Fitted Governor

| 2b Fu | ill-load stop                                     | 6 Rotational-<br>speed Irmitat | iel delivery<br>paracteristics | Starting fuel delivery 5      |         |                               | 4a Idle stop |                             |  |
|-------|---|--------------------------------|--------------------------------|-------------------------------|---------|-------------------------------|--------------|-----------------------------|--|
|       | emp_40°C (104°F)<br>cm <sup>1</sup> /1000 strokes | Note changed to ) rev/min      | rev/min                        | cm <sup>3</sup> /1000 strokes | rev/min | cm <sup>1</sup> /1000 strokes | rev/min      | Control rod<br>travel<br>mm |  |
| 1     | 2   | 3                              | 4                              | 5                             | 6       | 7                             | 8            | 9                           |  |
| Take  | from VDT-I-401/                                   | 103                            |                                |                               | -       | -                             | -            | -                           |  |
|       |   |                                |                                |                               |         |                               |              |                             |  |
|       |   |                                |                                |                               |         |                               |              |                             |  |

Checking values in brackets

\* 1 mm less control rod travel than col 2

6.84

Geschaftsbereich KH. Kundendienst. Kfz-Ausrustung. 1980 by Robert Bosch GmbH, Postfach 50. D-7000 Stuttgart 1. Printed in the Federal Republic of Germany Imprimé en République Fédérale d'Allemagne par Robert Bosch GmbH.

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WPP 001/4 KHD 9,2 b

1. Edition

En

PE 4 P 100/420 LS 99

RSV 250-1000 P 7/304 R

supersedes KHD

F 4 M 716

Komb.-Nr. 0 401 874 022

Note VDT-I-401/ 103

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

## A. Fuel Injection Pump Settings

Port closing at prestroke

2,0**-2,1** (1,95**-**2,15)

mm (from BDC)

| Rotational<br>speed<br>rev/min<br>1 | Control rod<br>travel<br>mm 2 | Fuel delivery<br>cm·/100 strokes<br>3        | Oifference<br>cm <sup>-/</sup><br>100 strokes<br>4 | Control rod<br>travel<br>mm<br>2 | Fuel delivery<br>cm·/100 strokes<br>3 | Spring pre tensioning<br>(torque control valve)<br>mm |
|-------------------------------------|-------------------------------|--|--|----------------------------------|---------------------------------------|---|
| 1000                                | 12,0                          | 12,4-13,2                                    | 0,5  |                                  |                                       |   |
| 600<br>600<br>600<br>200            | 9,0<br>12,0<br>15,0<br>9,0    | 5,4-6,4<br>11,4-12,7<br>17,5-18,8<br>3,6-4,6 |  |                                  |                                       |   |

Adjust the fuel delivery from each outlet according to the values in

#### **B. Governor Settings**

| Uppe<br>Degree of<br>deflection<br>of control<br>lever | r rated speed<br>Control rod<br>travel<br>mm | rev/min<br>Control rod<br>travel<br>mm rev/min | Intermed | diate rated | speed | Control-<br>lever<br>deflection<br>in degrees<br>7 |                   | rated speed<br>Control rod<br>travel<br>mm | 9                 | rque control<br>Control rad<br>mavel<br>mm |
|--|--|--|----------|-------------|-------|--|-------------------|--|-------------------|--|
| ca. 68   | 1000<br>1050<br>1080                         | 16.0<br>9,0<br>4,0                             | witho    | ut aux      | iliar | ca. 28<br>v spring                                 | 300<br>100<br>300 | 6,0<br>19-21<br>5,7-6,3                    | 980<br>450<br>340 | 0<br>0<br>1,2-1,8                          |
| 23   | 1050<br>1100<br>1180                         | 7,0-10,0<br>1,5-3,8<br>0-1,0                   | with     | auxili      | ary s | pring  | 350<br>450        | 3,2-4,5<br>0-1,0                           |                   |  |

The numbers denote the sequence of the tests

## C. Settings for Fuel Injection Pump with Fitted Governor

| 6       | ult-load stop<br>emp 40°C (104°F) | Rotational-<br>speed limitat | 3a Fuel delivery characteristics |                  | Starting I | uel delivery 5                     | <b>43</b> ld! | e stop<br>(Control rod |
|---------|-----------------------------------|------------------------------|----------------------------------|------------------|------------|------------------------------------|---------------|------------------------|
| rev/min | cm*/1000 strokes                  | changed to ) rev/min 3       | rev/min                          | cm1/1000 strokes | rev/min    | cm <sup>1</sup> /1000 strokes<br>7 | rev/min<br>8  | travel<br>mm<br>9      |
| Take    | From VDT-I-401/                   | 03                           |                                  |                  | -          | ē <b>=</b>                         | -             | -                      |
|         |                                   |                              |                                  |                  |            |                                    | ŀ             |                        |
|         |                                   |                              |                                  |                  |            |                                    |               |                        |

Checking values in brackets

\* 1 mm less control rod travel than col 2

6.84

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Geschaftsbereich KH. Kundendienst. Kfz-Ausrustung i 1980 by Robert Bosch GmbH. Postfach 50. D-7000 Stuttgart 1. Printed in the Federal Republic of Germany Imprimé en République Fédérale d'Allemagne par Robert Bosch GmbH.

WPP 001/4 KHD 9,2 b 1

1. Edition

PE 4 P 100 A 420 LS 99

RSV 250-1000 P 7/304 R

supersedes." KHD

Komb.-Nr. 0 401 874 023

Note VDT-I-401/ 103

company F 4 M 716

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

# A. Fuel Injection Pump Settings

Porticlosing at prestroke (1.95-2.15)

2,0-2,1

mm (from BDC)

| Rotational<br>speed      | Control rod<br>travel      | Fuel delivery                                | Difference                           | Control rod<br>travel | Fuel delivery        | Spring pre tensioning<br>(torque-control valve) |
|--------------------------|----------------------------|--|--------------------------------------|-----------------------|----------------------|---|
| téa/unu                  | mm 2                       | cm·/100 strokes                              | cm <sup>-/</sup><br>100 strokes<br>4 | mm<br>2               | cm*/100 strokes<br>3 | mm<br>6   |
| 1000                     | 12,0                       | 12,4-13,2                                    | 0,5                                  |                       |                      |   |
| 600<br>600<br>600<br>200 | 9,0<br>12,0<br>15,0<br>9,0 | 5,4-6,4<br>11,4-12,7<br>17,5-18,8<br>3,6-4,7 |                                      |                       |                      |   |

Artificial the fuel delivery from each outlet according to the values in E

### **B.** Governor Settings

| 14 7 / | rated speed<br>Control rod<br>travel<br>mm |                              | Intermed | diate rated | speed  | Control-<br>tever<br>deflection<br>in degrees<br>7 |                   | raled speed<br>Control rod<br>travel<br>mm |                   | rque control<br>Control rod<br>travel<br>mm |
|--------|--|------------------------------|----------|-------------|--------|--|-------------------|--|-------------------|---|
| ca. 68 | 1000<br>1050<br>1080                       | 16,0<br>9,0<br>4,0           | witho    | out aux     | xiliar | ca. 28<br>y sprinc                                 | 100               | 6,0<br>19-21                               | 980<br>450<br>340 | 0<br>0<br>1,2-1,8                           |
| 29     | 1050<br>1100<br>1180                       | 7,0-10,0<br>1,5-3,8<br>0-1,0 | with     | auxi1       | iary s | pring  | 300<br>350<br>450 | 5,7-6,3<br>3,2-4,5<br>0-1,0                |                   |   |

The numbers denote the sequence of the tests

# C. Settings for Fuel Injection Pump with Fitted Governor

|      | ii load stop                  | 6 Rotational-<br>speed limitat |              | el delivery Star<br>aracteristics Idle |         | uel delivery 5                     |   | e stop :          |
|------|-------------------------------|--------------------------------|--------------|--|---------|------------------------------------|---|-------------------|
|      | cm <sup>-</sup> /1000 strokes | Note changed to 3 rev/min 3    | revimin<br>4 | cm <sup>3</sup> /1000 strokes<br>5     | rev/min | cm <sup>2</sup> /1000 strokes<br>7 |   | travel<br>mm<br>9 |
| Take | from VDT-I-401/               | 103                            |              |  | -       | -                                  | - | -                 |
|      |                               |                                |              |  |         |                                    | i |                   |
|      |                               |                                |              |  |         |                                    |   |                   |

Checking values in brackets

\* 1 mm less control rod travel than col. 2

6.84

Geschaftsbereich KH. Kundendienst. Kfz-Ausrustung
1980 by Robert Bosch GmbH. Postfach 50. D-7000 Stuttgart 1. Printed in the Federal Republic of Germany
Imprimé en Republique Fédérale d'Allemagne par Robert Bosch GmbH.

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WPP 001/4 KHD 9,2 a

1. Edition

PE 4 P 100/420 LS 99

RSV 250-1000 P 7/312 R

supersedes =

Komb.-Nr. 0 401 874 021

company KHD

Note VDT-I-401/ 103

engine F 4 M 716

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

# A. Fuel Injection Pump Settings

Port closing at prestroke

Testoil-180 4113

2,0-2,1 (1,95-2,15)

mm (from BDC)

| Rotational<br>speed<br>rev/min<br>1 | Control rod<br>travel      | Fuel delivery<br>cm/100 strokes<br>3         | Difference<br>cm <sup>-/</sup><br>100 strokes<br>4 | Control rod<br>travel<br>mm<br>2 ~ | Fuel delivery  cm:/100 strokes 3 | Spring pre tensioning<br>(torque-control valve)<br>mm<br>6 |
|-------------------------------------|----------------------------|--|--|------------------------------------|----------------------------------|--|
| 1000                                | 12,0                       | 12,4-13,2                                    | 0,5  |                                    |                                  |  |
| 600<br>600<br>600<br>200            | 9,0<br>12,0<br>15,0<br>9,0 | 5,4-6,4<br>11,4-12,7<br>17,5-18,8<br>3,6-4,6 |  |                                    |                                  |  |

Argust the fuel delivery from each outlet according to the values in

#### **B.** Governor Settings

| 14 1 / | rated speed<br>Control rod<br>travel<br>mm |                              | Intermed | diate rated        | speed<br>6 | Control-<br>lever<br>deflection<br>in degrees<br>7 | Lower<br>rev/min<br>8 | raled speed<br>Control rod<br>travel<br>mm | 3 To              | rque control<br>Control rod<br>travel<br>mm |
|--------|--|------------------------------|----------|--------------------|------------|--|-----------------------|--|-------------------|---|
| ca. 68 | 1000<br>1050<br>1080                       | 16,0<br>9,0<br>4,0           | witho    | ut au              | kiliar     | ca. 28<br>y spring                                 | 100                   | 6,0  | 980<br>450<br>340 | 0<br>0<br>1,2-1,8                           |
| 23     | 1050<br>1100<br>1180                       | 7,0-10,0<br>1,5-3,8<br>0-1,0 | with     | auxil <sup>·</sup> | iary s     | pring  | 300<br>350<br>450     | 5,7-6,3<br>3,2-4,5<br>0-1,0                |                   |   |

The numbers denote the sequence of the tests

# C. Settings for Fuel Injection Pump with Fitted Governor

|         | ill load stop                            | Rotational-<br>speed limitat |         | Fuel delivery characteristics      |         | uel delivery 5        | da Idle stop |                   |  |
|---------|--|------------------------------|---------|------------------------------------|---------|-----------------------|--------------|-------------------|--|
| rev/min | emp 40 C (104·F)<br>cm/1000 strokes<br>2 | changed to ) rev/min 3       | rev/min | cm <sup>3</sup> /1000 strokes<br>5 | rev/min | cm /1000 strokes<br>7 |              | travel<br>mm<br>9 |  |
| Take    | rom VDT-1-401/                           | 03                           |         |                                    | -       | -                     | -            | •                 |  |
|         |  |                              |         |                                    |         |                       |              |                   |  |
|         |  |                              |         |                                    |         |                       |              |                   |  |

Checking values in brackets

\* 1 mm less control rod travel than col 2

6.84

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Geschaftsbereich KH. Kundendienst. Kfz-Ausrustung. 1980 by Robert Bosch. GmbH. Postfach 50. D-7000 Stuttgart 1. Printed in the Federal Republic of Germany Imprimé en République Fedérale d'Allemagne par Robert Bosch. GmbH.

WPP 001/4 KHD 18,3 f

1. Edition

PE 6 P 100/420 LS 111

RSV 250-1000 P 7/317 R

supersedes" KHD company

Komb.-Nr. 0 401 876 061 Note VDT-I-401/ 103

F 6 M 716

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

#### A. Fuel Injection Pump Settings

Port closing at prestroke

2,0-2,1 (1.95-2.15)

mm (from BDC)

| Rotational<br>speed<br>rev/min<br>1 | Control rod travel         | Fuel delivery<br>cm /100 strokes<br>3        | Difference<br>cm <sup>-y</sup><br>100 strokes<br>4 | Control rod<br>travel<br>mm | Fuel delivery<br>cm//100 strokes<br>3 | Spring pre-tensioning (torque-control valve) mm 6 |
|-------------------------------------|----------------------------|--|--|-----------------------------|---------------------------------------|---|
| 1000                                | 12,0                       | 12,4-13,2                                    | 0,5  |                             |                                       |   |
| 600<br>600<br>600<br>200            | 9,0<br>12,0<br>15,0<br>9,0 | 5,4-6,4<br>11,4-12,7<br>17,5-18,8<br>3,6-4,6 |  | ,                           |                                       |   |

Adjust the fuel delivery from each outlet according to the values in E

#### **B.** Governor Settings

| Degree of deflection of control lever | r rated speed<br> Control rod<br> travel<br> mm<br> 2 |                              | Intermed | diate rated | speed  | Control-<br>lever<br>deflection<br>in degrees<br>7 | Lower<br>rev/min<br>8 | rated speed<br> Control rod<br> travel<br> mm<br> 9 | 11.37             | rque control<br>Control rod<br>travel<br>mm |
|---------------------------------------|---|------------------------------|----------|-------------|--------|--|-----------------------|---|-------------------|---|
| ca. 68                                | 1000<br>1050<br>1080                                  | 16,0<br>9,0<br>4,0           | witho    | ut aux      |        | ca. 28<br>y spring                                 | 100                   | 6,0   | 980<br>450<br>340 | 0<br>0<br>1,2-1,8                           |
| 28                                    | 1050<br>1100<br>1180                                  | 7,0-10,0<br>1,5-3,8<br>0-1,0 | with     | auxili      | iary s | pring  | 300<br>350<br>450     | 5,7-6,3<br>3,2-4,5<br>0-1,0                         |                   |   |

The numbers denote the sequence of the tests

## C. Settings for Fuel Injection Pump with Fitted Governor

| (1)     | ill-load stop                               | Rotational-<br>speed limitat         |         | nel delivery<br>paracteristics     | Starting f | uel delivery 5        | (4a) ldi | e stop            |
|---------|---|--------------------------------------|---------|------------------------------------|------------|-----------------------|----------|-------------------|
| rev/min | emp 40° C (104°F)<br>cm //1000 strokes<br>2 | Note<br>changed to )<br>rev/min<br>3 | rev/min | cm <sup>1</sup> /1000 strokes<br>5 | rev/min    | cm /1000 strokes<br>7 | rev/min  | travel<br>mm<br>9 |
| Take    | from VDT-I-401/                             | 103                                  |         |                                    | -          | -                     | -        | -                 |
|         |   |                                      |         |                                    |            |                       |          | :                 |

Checking values in brackets

\* 1 mm less control rod travel than col 2

6.84

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WPP 001/4 KHD 18,3 f 1

1. Edition

PE 6 P 100 A 420 LS 111

RSV 250-1000 P 7/317 R

supersedes compan KHD engine F 6 M 716

Komb.-Nr. 0 401 876 139

Note VDT-I-401/ 103

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

## A. Fuel Injection Pump Settings

2,0-2,1
Port closing at prestroke (1.95-2,15)

mm (from BDC)

| • | ı |  |
|---|---|--|
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| Rotational speed         | Control rod travel         | Fuel delivery                                | Difference                            | Control rod<br>travel | Fuel delivery    | Spring pre-tensioning<br>(torque-control valve) |
|--------------------------|----------------------------|--|---------------------------------------|-----------------------|------------------|---|
| ev/min                   | mm 2                       | cm /100 strokes                              | cm <sup>1</sup> /<br>100 strokes<br>4 | mm<br>2               | cm 1/100 strokes | mm<br>6   |
| 1000                     | 12,0                       | 12,4-13,2                                    | 0,5                                   |                       |                  |   |
| 600<br>600<br>600<br>200 | 9,0<br>12,0<br>15,0<br>9,0 | 5,4-6,4<br>11,4-12,7<br>17,5-18,8<br>3,6-4,6 |                                       |                       |                  |   |

Adjust the fuel delivery from each outlet according to the values in  $\Box$ 

#### **B.** Governor Settings

| (1) Uppe                        | r rated speed         | l rev/min                           | Interme | diate rated | speed  | (4)                             | Lower             | rated speed                 | 11 3 1     | rque control                |
|---------------------------------|-----------------------|-------------------------------------|---------|-------------|--------|---------------------------------|-------------------|-----------------------------|------------|-----------------------------|
| Degree of deflection of control | Control rod<br>travel | Control rod<br>travel<br>mm rev/min |         |             |        | Control-<br>lever<br>deflection | rev/min           | Control rod<br>travel<br>mm | rev/min    | Control rod<br>travel<br>mm |
| lever<br>1                      | 2                     | 3                                   | 4       | 5           | 6      | in degrees<br>7                 | 8                 | 9                           | 10         | 11                          |
| ca. 68                          | 1000                  | 16,0                                |         |             |        | ca. 28                          | 300               | 6,0                         | 980        | 0                           |
|                                 | 1050<br>1080          | 9,0<br>4,0                          | with    | out aux     | xiliaı | y spring                        | 100               | 19-21                       | 450<br>340 | 1,2-1,8                     |
| 29                              | 1050<br>1100<br>1180  | 7,0-10,0<br>1,5-3,8<br>0-1,0        | with    | auxil       | iary : | pring                           | 300<br>350<br>450 | 5,7-6,3<br>3,2-4,5<br>0-1,0 |            |                             |

The numbers denote the sequence of the tests

## C. Settings for Fuel Injection Pump with Fitted Governor

|      | emp 40 C (104 F)<br>cm*/1000 strokes | Rotational-<br>speed limitat<br>Note<br>changed to 3<br>rev/min |   | el delivery<br>aracteristics<br>cm <sup>3</sup> /1000 strokes | rev/min | uel delivery 5 | • | Control rod<br>travel |
|------|--------------------------------------|---|---|---|---------|----------------|---|-----------------------|
| Take | from VDT-I-401/                      | 103   | 4 | 5   | -       | -              | • | -                     |
|      |                                      |   |   |   |         |                |   |                       |

Checking values in brackets

\* 1 mm less control rod travel than col 2

6.84

**BOSCH** 

Geschaftsbereich KH. Kundendienst. Kfz. Außrüstung. < 1980 by Robert Bosch GmbH, Postfach 50. D-7000 Stultgart 1. Printed in the Federal Republic of Germany imprimé en Republique Fédérale d'Allemagne par Robert Bosch GmbH.

40

WPP 001/4 KHD 18,3 g

1. Edition

Ε'n

PE 6 P 100/420 LS 111

RSV 250-1000 P 7/361 DR

supersedes\*

Company

KHD

F 6 M 716

engine

Komb.-Nr. 0 401 876 132

Note VDT-I-401/ 103

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

## A. Fuel Injection Pump Settings

2,0-2,1 Port closing at prestroke (1,95-2,15)

mm (from BDC)

| Rotational speed         | Control rod                | Fuel delivery                                | Difference                            | Control rod<br>travel | Fuel delivery   | Spring pre-tensioning (to-que-control valve) |
|--------------------------|----------------------------|--|---------------------------------------|-----------------------|-----------------|--|
| rev/min                  | mm 2                       | cm /100 strokes                              | cm <sup>-</sup> /<br>100 strokes<br>4 | mm<br>2               | cm 1100 strokes | mm<br>6                                      |
| 1000                     | 12,0                       | 12,4-13,2                                    | 0,5                                   |                       |                 |  |
| 600<br>600<br>600<br>200 | 9,0<br>12,0<br>15,0<br>9,0 | 5,4-6,4<br>11,4-12,7<br>17,5-18,8<br>3,6-4,6 |                                       |                       |                 |  |

Adjust the fuel delivery from each outlet according to the values in

### **B.** Governor Settings

|        | rated speed<br>Control rod<br>travel<br>mm |                              | Intermed | diate rated | speed  | Control-<br>lever<br>deflection<br>in degrees<br>7 | Lowe<br>rev/min<br>8 | r rated speed<br>  Control rod<br>travel<br>  mm<br>  9 | rev/min           | rque control<br> Control rod<br> travel<br> mm<br>  11 |
|--------|--|------------------------------|----------|-------------|--------|--|----------------------|---|-------------------|--|
| ca. 68 | 1000<br>1050<br>1080                       | 16,0<br>9,0<br>4,0           | witho    | ut aux      | kiliar | ca. 28<br>y spring                                 | 100                  | 6,0   | 980<br>630<br>340 | 0<br>0,9-1,1<br>0,9-1,1                                |
| 29     | 1050<br>1100<br>1180                       | 7,0-10,0<br>1,5-3,8<br>0-1,0 | with     | auxili      | iary s | pring  | 300<br>350<br>450    | 5,7-6,3<br>3,2-4,5<br>0-1,0                             |                   |  |

The numbers denote the sequence of the tests

#### C. Settings for Fuel Injection Pump with Fitted Governor

| <b>(2b)</b> <sup>Fu</sup> | II load stop                                      | 6 Rotational speed limitat |         | iel delivery<br>paractenstics | Starting f | uel delivery 5                | (a) Idi | Idle stop                   |  |
|---------------------------|---|----------------------------|---------|-------------------------------|------------|-------------------------------|---------|-----------------------------|--|
| est oil te                | emp 40 C (104 F)<br>cm <sup>1</sup> /1000 strokes | Note changed to ) rev/min  | rev/min | cm <sup>-</sup> /1000 strokes | rev/min    | cm <sup>1</sup> /1000 strokes | rev/min | Control rod<br>travel<br>mm |  |
| 1                         | 2   | 3                          | 4       | 5                             | 6          | 7                             | 8       | 9                           |  |
| Take                      | from VDT-I-401/                                   | 103                        |         |                               | - 4        | -                             | -       | -                           |  |
|                           |   |                            |         |                               |            |                               |         |                             |  |
|                           |   |                            |         |                               |            |                               |         |                             |  |
|                           |   |                            |         |                               |            |                               |         |                             |  |

Checking values in brackets

\* 1 mm less control rod travel than col 2

6.84

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40

WPP 001/4 KHD 18,3 g 1

1. Edition

En

PE 6 P 100 A 420 LS 111 Komb.-Nr. 0 401 876 133 RSV 250-1000 P 7/361 DR

supersedes KHD company F 6 M 716

engine

Note VDT-I-401/ 103

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

## A. Fuel Injection Pump Settings

Port closing at prestroke

2,0-2,1 (1,95-2,15)

mm (from BDC)

| Rotational speed rev/min | Control rod travel         | Fuel delivery                                | Difference<br>cm <sup>-/</sup><br>100 strokes | Control rod<br>travel | Fuel delivery | Spring pre tensioning (torque-control valve) |
|--------------------------|----------------------------|--|---|-----------------------|---------------|--|
| 1                        | 2                          | 3  | 4   | 2                     | 3             | 6  |
| 1000                     | 12,0                       | 12,4-13,2                                    | 0,5   |                       |               |  |
| 600<br>600<br>600<br>200 | 9,0<br>12,0<br>15,0<br>9,0 | 5,4-6,4<br>11,4-12,7<br>17,5-18,8<br>3,6-4,6 |   |                       |               |  |

Adjust the fuel delivery from each outlet according to the values in

#### **B.** Governor Settings

| Degree of deflection of control lever | r rated speed<br>Control rod<br>travel<br>mm |                              | Intermed | diate rated        | speed  | Control-<br>lever<br>deflection<br>in degrees<br>7 | Lower<br>rev/min<br>8 | rated speed<br>Control rod<br>travel<br>mm | 3 to<br>rev/min<br>10 | rque control<br> Control rod<br>travel<br>mm |
|---------------------------------------|--|------------------------------|----------|--------------------|--------|--|-----------------------|--|-----------------------|--|
| ca. 68                                | 1000<br>1050<br>1080                         | 16,0<br>9,0<br>4,0           | witho    | out aux            | kiliar | ca. 28<br>y spring                                 | 100                   | 6,0  | 980<br>630<br>340     | 0<br>0,9-1,1<br>0,9-1,1                      |
| 28                                    | 1050<br>1100<br>1180                         | 7,0-10,0<br>1,5-3,8<br>0-1,0 | with     | auxil <sup>·</sup> | iary s | pring  | 300<br>350<br>450     | 5,7-6,3<br>3,2-4,5<br>0-1,0                |                       |  |

The numbers denote the sequence of the tests

## C. Settings for Fuel Injection Pump with Fitted Governor

|      |                 | Rotational-<br>speed limital<br>Note<br>changed to 1<br>rev/min | el delivery<br>aracteristics<br>cm <sup>1</sup> /1000 strokes | Starting f Idle rev/min | cm <sup>1</sup> /1000 strokes | Idle stop  Control rod travet mm  8 |   |
|------|-----------------|---|---|-------------------------|-------------------------------|-------------------------------------|---|
| Take | from VDT-I-401/ | 103   |   | -                       | -                             | -                                   | • |
|      |                 |   |   |                         |                               |                                     |   |

Checking values in brackets

\* 1 mm less control rod travel than cof 2

6.84

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Testoil-ISO 411

# Test Specifications Fuel Injection Pumps ② and Governors

40

WPP 001/4 FIA 13,8 a 5 1. Edition

En

PE 6 P 120 A 720 RS 167 RQ 225/1100 PA 703 Komb.-Nr. 0 401 846 496 Values only apply to test nozzle-and-holder assembly 1 688 901 019 and fuel-injection test tubing 1 680 750 067

supersedes company Fiat engine 8210.02 184 kW

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

# A. Fuel Injection Pump Settings

Port closing at prestroke

(1.95 - 2.15)

mm (from BDC)

| Rotational speed rev/min | Control rod<br>travel<br>mm | Fuel delivery<br>cm <sup>3</sup> /100 strokes<br>3 | Difference<br>cm³/<br>100 strokes<br>4 | Control rod<br>travel<br>mm<br>2 | Fuel delivery  cm <sup>3</sup> /100 strokes 3 | Spring pre-tensioning<br>(torque-control valve)<br>mm<br>6 |
|--------------------------|-----------------------------|--|--|----------------------------------|---|--|
| 1100                     |                             |  | 0,5 (0,8                               |                                  |   |  |
| 225                      | 7,5-7,7                     | 1,7 - 2,3  | 0,8'(1,2                               |                                  |   |  |
|                          |                             |  |  |                                  |   |  |

Adjust the fuel delivery from each outlet according to the values in [

### **B. Governor Settings**

|         | Checking of slider PRG check  The setting point  Setting point |     | int          | Test spec                         |                                   |                                 |              |                                    |              | Torque control  Control rod     |               |                        |
|---------|--|-----|--------------|-----------------------------------|-----------------------------------|---------------------------------|--------------|------------------------------------|--------------|---------------------------------|---------------|------------------------|
| rev/min | Control rod<br>travel<br>mm                                    |     | rev/min<br>3 | Control<br>red travel<br>rmm<br>4 | Control<br>red travel<br>rnm<br>5 | rev/min                         | rev/min<br>7 | Control<br>red travel<br>mmrn<br>8 | rev/min<br>9 | Control rod<br>travet<br>mm     | rev/min<br>11 | travel                 |
| 550     | 15,6 -   | 16, | 4 550        | 16,0                              | ľ                                 | 1145-1160<br>1185-1215<br>0,1,0 | ı            | 7,6                                | 225          | nin.9,1<br>7,5-7,7<br>405 = 2,0 |               | 11,1-11,2<br>11,1-11,3 |
|         |  |     |              |                                   | <u></u>                           |                                 |              | L                                  | 145 -        | <br> 160 min-1                  | <u> </u>      | 1 mm less contro       |

Torque-control travel on flyweight assembly dimension a =

mm

Speed regulation: At

1 mm less control rod travel

## C. Settings for Fuel Injection Pump with Fitted Governor

|              | elivery on control lever np 40°C (104°F) | Control rod stop 3a | Fuel deliv   | ery characteristics                 | Starting for<br>Idle spee | Contret   |
|--------------|--|---------------------|--------------|-------------------------------------|---------------------------|---|
| rev/min<br>1 | cm <sup>3</sup> /~1000 strokes<br>2      | rev/min<br>3        | rev/min<br>4 | cm <sup>3</sup> /-1000 strokes<br>5 | rev/min<br>6              | red travel<br>cm <sup>3</sup> /1000 strokes / mm<br>7 |
| 1100         | 170,0-173,0<br>(167,0-176,0)             | -                   | -            | -                                   | -                         | -   |
|              |  |                     |              |                                     |                           |   |
|              |  |                     |              |                                     |                           |   |

Checking values in brackets

7.84

BOSCH

WPP 001/4 MB 11,8 b 1 2. Edition

PE 6 P 110/720 RS 176

RSV 300-1100 P 1/303 R

Komb.-Nr. 0 401 876 110

supersede 7.78 company Daimler-Benz OM 355 Schmitt Schneefräse

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

#### A. Fuel Injection Pump Settings

Port closing at prestroke

(1)

2,8-2,9 (2,75-2,95)

mm (from BDC) RW = 9,0-12,0 mm

| Rotational speed | Control rod |                              |                                      | Control rod<br>travel | Fuel delivery   | Spring pre-tensioning (torque-control valve) |
|------------------|-------------|------------------------------|--------------------------------------|-----------------------|-----------------|--|
| rev/min          | mm 2        | cm <sup>1</sup> /100 strokes | cm <sup>-/</sup><br>100 strokes<br>4 | mm<br>2               | cm /100 strokes | mm<br>6                                      |
| 1100             | 12,7+0,1    | 13,5-13,7                    | 0,4 (0,8)                            |                       |                 |  |
| 300              | 7,5-7,7     | 1,2-1,8                      | 0,4 (0,7)                            | *                     |                 |  |
|                  | 1           |                              | }                                    |                       |                 |  |
|                  |             |                              |                                      |                       |                 |  |

Adjust the fuel delivery from each outlet according to the values in C

#### **B. Governor Settings**

| 14 0 / | Control rod   Control rod   travel   mm   rev/min   2   3 |                                   | Intermediate rated speed 4 5 6 |   | Control-<br>lever<br>deflection<br>in degrees |       | rated speed<br>Control rod<br>travel<br>mm | 3 10<br>rev/min<br>10 | rque control<br>Control rod<br>travel<br>mm |  |
|--------|---|-----------------------------------|--------------------------------|---|---|-------|--|-----------------------|---|--|
| max.   | 800<br>x =  | 0,3-1,0<br>4,75                   | -                              | - | •   | ca.21 | 300<br>300                                 | 7,1<br>7,5-7,7        |   |  |
| ca. 56 | 11,7<br>4,0<br>1260                                       | 1140-1150<br>1235-1255<br>0,3-1,7 |                                |   |   |       | 495-555                                    | = 2,0                 |   |  |

The numbers denote the sequence of the tests

## C. Settings for Fuel Injection Pump with Fitted Governor

|         | ill load stop<br>emp 40 C (104 F) | 6 Rotational speed irritat |              | el delivery<br>aracteristics | Starting f | uel delivery 5        | 4a) Idle stop |                   |  |
|---------|-----------------------------------|----------------------------|--------------|------------------------------|------------|-----------------------|---------------|-------------------|--|
| rev/min | cm:/1000 strokes                  | changed to 1 rev/min 3     | rev/min<br>4 | cm:/1000 strokes             | rev/min    | cm'/1000 strokes<br>7 | rev/min<br>8  | travet<br>mm<br>9 |  |
| 1100    | 135,0-137,0<br>(132,0-140,0)      | 1140-1150*                 | -            | -                            | 100        | 170,0-190             | 0 -           | -                 |  |

Checking values in brackets

\* 1 mm less control rod travel than col 2

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WPP 001/4 MB 11,8 b 2

1. Edition

En

PE 6 P 110/720 RS 176

EP/RSV 350-750 P 4/397 R

compandaimler-Benz OM 355 engine

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

#### A. Fuel Injection Pump Settings

Port closing at prestroke

2,8-2,9 75-2 951

mm (from BDC)

| Rotational<br>speed | Control rod<br>travel | Fuel delivery                   | Difference  | Control rod travel | Fuel delivery   | Spring pre-tensioning (torque-control valve) |
|---------------------|-----------------------|---------------------------------|-------------|--------------------|-----------------|--|
| rev/min             | mm (2)                | cm1/100 strokes                 | 100 strokes | mm                 | cm1/100 strokes | mm   |
| 1                   | 2                     | 3                               | 4           | 2                  | 3               | 6  |
| 1000                | 12,0                  | 11,3-12,3                       | 0,4         |                    |                 |  |
| 600<br>600<br>200   | 9,0<br>15,0<br>9,0    | 4,3-5,5<br>15,5-17,2<br>2,6-3,6 |             |                    |                 |  |

Adjust the fuel delivery from each outlet according to the values in

#### **B. Governor Settings**

|                    | r rated speed<br>Control rod<br>travel<br>mm |                              |       | liate rated   | speed  | Control-<br>fever<br>deflection<br>in degrees<br>7 | Lowe<br>rev/min<br>8 | r rated speed<br>Control rod<br>travel<br>mm | 3 To | rque control<br> Control rod<br> travel<br> mm<br>  11 |
|--------------------|--|------------------------------|-------|---------------|--------|--|----------------------|--|------|--|
| ca. 44             | 750<br>800<br>825                            | 16,0<br>8,6<br>4,0           | witho | ut aux        | iliar  | ca. 23<br>y spring                                 |                      | 6,0<br>19,0-21,0<br>5,9-6,1                  |      | **   |
| ca 42<br><b>28</b> | 765 c  | a. 11,0<br>a. 3,8<br>),1-1,0 | witho | <u>ut</u> aux | ciliar | y spring   | 400                  | 0 - 1,0                                      |      |  |

The numbers denote the sequence of the tests then 1/2 turn back.

Set idle -speed auxiliary spring at 2.0 mm control-rod travel

### C. Settings for Fuel Injection Pump with Fitted Governor

| <b>C</b>                    | Speed innitat  |                           |         | uel delivery<br>naracteristics     | Starting fi | uel delivery 5                     | 4a) tdle stop |                             |
|-----------------------------|--|---------------------------|---------|------------------------------------|-------------|------------------------------------|---------------|-----------------------------|
| Test oil fe<br>rev/min<br>1 | emp_40°C (104°F)<br>cm <sup>1</sup> /1000 strokes<br>2 | Note changed to ) rev/min | rev/min | cm <sup>3</sup> /1000 strokes<br>5 | rev/min     | cm <sup>1</sup> /1000 strokes<br>7 | rev/min       | Control rod<br>travel<br>mm |
| 730                         | 135,0-138,0  | 750-760*                  | 780-8   | 00 = 3,8 mm RW                     | -           | -                                  | -             | -                           |
|                             |  |                           |         |                                    |             |                                    |               |                             |

Checking values in brackets

\* 1 mm less control rod travel than col 2

5.84

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WPP 001/4 STE 8,1 a 1

1. Edition

PE 6 P 110 A 721 RS 195 Z

0

ROV 250-1300 PA 257 DR

supersedas companySteyr

Komb.-Nr. 0 401 856 121

engine

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

### A. Fuel Injection Pump Settings

| Port closing at pres     | troke (                    | 2.75-2.95)                                 | mm (from BDC) |             |                              |  |
|--------------------------|----------------------------|--|---------------|-------------|------------------------------|--|
| Rotational speed         |                            | Fuel delivery                              | Difference    | Control rod | Fuel delivery                | Spring pre-tensioning (torque-control valve) |
| rev/min                  | mm                         | cm <sup>3</sup> /100 strokes               | 100 strokes   | mm          | cm <sup>3</sup> /100 strokes | mm   |
| 1                        | 2                          | 3  | 4             | 2           | 3                            | 6  |
| 1000                     | 12,0                       | 9,8-10,5                                   | 0,5           |             |                              |  |
| 600<br>600<br>600<br>200 | 9,0<br>12,0<br>15,0<br>9,0 | 3,2-4,2<br>8,2-9,4<br>13,7-15,3<br>1,1-2,1 |               |             |                              |  |

Adjust the fuel delivery from each outlet according to the values in

#### **B. Governor Settings**

| Upper rated s            | psed                                   |        | Intermedia                            | e rated sp | eed                   | Lower rated                           | speed                           |   | Sliding sleeve travel |                                      |
|--------------------------|--|--------|---------------------------------------|------------|-----------------------|---------------------------------------|---------------------------------|---|-----------------------|--------------------------------------|
| deflection<br>of control | rev/min<br>Control<br>rod travel<br>mm | travel | Degree of deflection of control lever | rev/min    | Control rod<br>travel | Degree of deflection of control lever | rev/min                         | Control rod<br>travel                       | rev/min               | mm ①                                 |
| 1                        | 2                                      | 3      | 4                                     | 5          | 6                     | 7                                     | 8                               | 9   | 10                    | 11                                   |
| ca. 50                   | 1340<br>1400<br>1450<br>1500<br>1570   | 0-5,8  |                                       | -          | •                     | ca. 13                                | 150<br>250<br>350<br>450<br>510 | 10,0-11,0<br>8,0-10,7<br>4,6-7,8<br>0,4-3,4 | 600<br>950            | 0,1-0,6<br>3,8-4,1<br>5,2-5,6<br>8,0 |
|                          |  |        |                                       |            |                       | <b>3</b>                              |                                 |   |                       |                                      |

Torque control travel a = 0.4 mm

# C. Settings for Fuel Injection Pump with Fitted Governor

| Full-load d<br>Control-ro  | d stop   | Irmitation | very characteristics (5a) | idle   | . •      | Torque-control 5 travel       |         |                             |
|----------------------------|--|------------|---------------------------|--|----------|-------------------------------|---------|-----------------------------|
| rest oil ter               | np 40°C (104°F) (2)<br> cm³/1000 strokes   | rev/min 49 | rev/min                   | cm <sup>3</sup> /1000 strokes  | switchir | cm <sup>3</sup> /1000 strokes | rev/min | Control rod<br>travel<br>mm |
| LDA<br>1300<br>LDA<br>1300 | 0,6 bar<br>117,0-119,0<br>(115,0-121,0)<br>0 bar<br>113,0-115,0<br>(111,0-117,0) |            | LDA<br>900<br>700<br>500  | 0,6 bar<br>115,0-118,0<br>(114,0-119,0)<br>114,0-118,0<br>(113,0-119,0)<br>104,0-110,0<br>103,0-111,0) |          | 120,0-140,0                   |         | 0<br>0,1-0,2<br>0,4-0,5     |

Chucking values in brackets

\* 1 mm less control rod travel than col 2

6.84

A20

BOSCH

# D. Adjustment Test for Manifold Pressure Compensator

STE 8,1 a 1

500 rev/min decreasing pressure - in bar gauge pressure

| Pump/governor              | Setting              | Measurement          | diminution Control rod travel difference |
|----------------------------|----------------------|----------------------|--|
|                            | Gauge pressure : bar | Gauge pressure - bar | enm (1)                                  |
| PE6PRS195Z<br>+ RQVPA257DR | 0,30                 | 0,46                 | Start<br>End                             |
|                            |                      |                      |  |

Notes

(1) when n

rev/min and gauge pressure =

bar ( \* maximum full-load control rod travel)

Testoil-ISO 4113

# **Test Specifications** Fuel Injection Pumps ① and Governors

WPP 001/4 FIA 13,8 t 2. Edition

PES 6 P 120 A 820 LS 249 Z Komb.-Nr. C 40, 046 103

ROV 300-1000 PA 204/4 R

superse@s 8 1 company iat engine 8217.12.024

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

### A. Fuel Injection Pump Settings

| Port closing at pres Rotational speed rev/min | Control rod travel | 2,0-2,1<br>,95-2.15)<br>Fuel delivery<br>cm <sup>3</sup> /100 strokes | mm (from BDC)  Difference  cm³/ 100 strokes 4 | Control rod<br>travel<br>mm<br>2 | Fuel delivery<br>cm <sup>3</sup> /100 strokes<br>3 | Spring pre-tensioning<br>(torque-control valve)<br>mm<br>6 |
|---|--------------------|---|---|----------------------------------|--|--|
| 1000  | 10,5+0,1           | 18,7 - 19,1   | 0,5(0,9)                                      |                                  |  |  |
| 300   | 5,9-6,1            | 2,2 - 2,8   | 0,65(0,9                                      | ,)                               |  |  |
|   |                    |   |   |                                  |  |  |

Adjust the fuel delivery from each outlet according to the values in

#### **B.** Governor Settings

| Upper rated                                    | speed              |  |                  | Intermediate                          | rated sp | eed                           | Lower rated                           | speed   |                               | Sliding s   | leeve travel       |
|--|--------------------|--|------------------|---------------------------------------|----------|-------------------------------|---------------------------------------|---------|-------------------------------|-------------|--------------------|
| Degree of<br>deflection<br>of control<br>lever | Control rod travel | Control red<br>travel<br>mm<br>rev/min | 0                | Degree of deflection of control lever | rev/min  | Control rod<br>travel<br>mm 4 | Degree of deflection of control lever | rev/min | Control rod<br>travel<br>mm 3 | rev/min     | (1)<br>mm<br>11    |
| max.   | 1000               | 15,2-17                                | ,8               | -                                     | -        | -                             | ca.14                                 | 100     | min.9,0                       | 1.50        | 1,5-1,7<br>3,6-4,2 |
| ·a.59  | 9,5<br>4,0<br>1300 | 1135-11                                | 50<br>165<br>1,0 |                                       |          |                               | 300-39                                | 300     | 5,9-6,1                       | 800<br>1000 | 6,4-5,6<br>7.9     |
|  |                    |  |                  |                                       |          |                               | 30                                    |         |                               |             |                    |

Torque control travel a =

# C. Settings for Fuel Injection Pump with Fitted Governor

| Full-load de<br>Control-roc<br>Test oil ten |                                    | Rotational-speed 20 limitation intermediate speed | Fuel deliv | peed 50                       | Starting<br>Idle<br>awitchin |                               | Torque-<br>travel | Control Control rod |
|---|------------------------------------|---|------------|-------------------------------|------------------------------|-------------------------------|-------------------|---------------------|
| rev/min                                     | cm <sup>3</sup> /1000 strokes      | rev/min 44  | rev/min    | cm <sup>3</sup> /1000 strokes | rev/min                      | cm <sup>3</sup> /1000 strokes | rev/min           | mm                  |
| 1   | 2                                  | 3   | 4          | 5                             | 6                            | 7                             | 8                 | 9                   |
| 1000  | 187, 0- 191, 0<br>(184, 0- 194, 0) | 1040-1050*  | -          | -                             | -                            | -                             | -                 | -                   |
|   |                                    |   |            |                               |                              | İ                             |                   |                     |
|   |                                    |   |            | L                             | <u> </u>                     |                               | <u> </u>          | L                   |

Checking values in brackets

\* 1 mm less control rod travel than col. 2

Testoli-SO 4113

# Test Specifications Fuel Injection Pumps ① and Governors

WPP 001/4 FIA 13,8 t 1 1. Edition

En.

PES 6 P 120 A 820 LS 249-1 Komb.-Nr. 0 402 046 230 RQV 300-750 PA 204

supersedes compafyi at engine 8 217.32.112 147 kW (200 PS)

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

#### A. Fuel Injection Pump Settings

| ort closing at pres | <del></del>           | 1,95 - 2,15)                 | Difference                       | Control rod | Fuel delivery                | Spring pre-tensioning  |
|---------------------|-----------------------|------------------------------|----------------------------------|-------------|------------------------------|------------------------|
| Rotational speed    | Control rod<br>travel | Fuel delivery                |                                  | travel      | Tool delivery                | (torque-control valve) |
| rev/min             | mm                    | cm <sup>3</sup> /100 strokes | cm <sup>3</sup> /<br>100 strokes | mm          | cm <sup>3</sup> /100 strokes | mm                     |
| 1                   | 2                     | 3                            | 4                                | 2           | 3                            | 6                      |
| 700                 | 9,7-9,8               | 14,9 - 15,3                  | 0,5 (0,9)                        |             |                              | _                      |
| 300                 | 5,9-6,1               | 1,8 - 2,4                    | 0,4 (0,7)                        | •           |                              |                        |
|                     |                       |                              | 1                                |             | ļ                            |                        |
|                     |                       | 1                            | 1                                |             |                              |                        |

Adjust the fuel delivery from each outlet according to the values in

#### **B. Governor Settings**

| Upper rated                           | peed  |                               | Inter         | mediate | rated spe    | ed               |          | Lower rated   | speed        |                              |          | Sliding s  | leeve travel            |
|---------------------------------------|---|-------------------------------|---------------|---------|--------------|------------------|----------|---|--------------|------------------------------|----------|------------|-------------------------|
| Degree of deflection of control lever | rev/min<br>Control<br>rod travel<br>mm<br>2 | travel                        | Degrate of co | ction   | rev/min<br>5 | Control retravel | <b>4</b> | Degree of<br>deflection<br>of control<br>lever<br>7 | rev/min<br>8 | Control<br>travel<br>mm<br>9 | rod<br>3 | rev/min    | mm<br>11                |
| max.                                  | 800   | 15,2-17,                      | 8             | -       | -            | _                |          | ca.11   | 100          | min.                         | 7,5      | 250        | 0 - 0,5                 |
| ca. 53                                | 8,7<br>4,0<br>900                           | 770 - 77<br>790 - 80<br>0-1,0 | - 1           |         |              |                  |          | 3a)   | 300<br>645   | 5,9-                         | 6,1      | 630<br>750 | 2, <b>4-</b> 2,6<br>5,8 |

Torque control travels = mm

### C. Settings for Fuel Injection Pump with Fitted Governor

| Full-load d<br>Control-ro<br>Test oil ten |                             | autounenists abeen | Fuel deliv | ery characteristics (5e)      | Starting<br>Idle<br>switching | . •              | Torque-<br>travel | Control 5 Control rod |
|---|-----------------------------|--------------------|------------|-------------------------------|-------------------------------|------------------|-------------------|-----------------------|
| rev/min                                   | cm³/1000 strokes            | rev/min 4e         | rev/min    | cm <sup>3</sup> /1000 strokes | rev/min                       | cm³/1000 strokes | rev/min           |                       |
| 1   | 2                           | 3                  | 4          | 5                             | 6                             | 7                | 8                 | 9                     |
| 700                                       | 149,0-153,0<br>(146,0-155,0 | 770 - 775*         | -          | -                             | -                             | -                | -                 | -                     |

Checking values in brackets

\* 1 mm less control rod travel than col 2

40

WPP 001/4 MB 10,0 a 1. Edition

En

PE 5 P 100 A 720 RS 265 Komb.-Nr. 9 400 087 240

RQ 250/1100 PA 269R

supersedes company Mercedes-Benz Brasil 0 M 355-5

1 - 2 - 4 - 5 - 3 je  $72^{\circ} \div 0,5^{\circ} (\div 0,75^{\circ})$ 

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

#### A. Fuel Injection Pump Settings

Port closing at prestroke

(2,75 - 2,95)

mm (from BDQRW=9.0 - 12,0 mm

| Rotational speed rev/min | Control rod<br>travel<br>mm | Fuel delivery<br>cm <sup>3</sup> /100 strokes<br>3 | Difference<br>cm <sup>3</sup> /<br>100 strokes<br>4 | Control rod<br>travel<br>mm<br>2 | Fuel delivery<br>cm <sup>3</sup> /100 strokes<br>3 | Spring pre-tensioning<br>(torque-control valve)<br>mm<br>6 |
|--------------------------|-----------------------------|--|---|----------------------------------|--|--|
| 1100                     | 13,0+0,1                    | 11.9 - 12.1  | 0,3 (0,6  |                                  |  |  |
| 250                      | 7,4-7,6                     | 1,7- 2,3   | 0,3 (0,5  |                                  |  |  |
|                          |                             |  | ;   |                                  |  |  |
|                          | 1                           |  |   |                                  |  |  |

Adjust the fuel delivery from each outlet according to the values in

#### **B.** Governor Settings

| PRG check Control rod I travel | Full-load speed re<br>Setting point<br>Cantrol<br>rev/min<br>3 | gulation Test specifications Control red travel rmm rev/min 5 6 | Control rod travel | Test specifications Control rod travel rev/min 9 | Control rod travel mm 12 |
|--------------------------------|--|---|--------------------|--|--------------------------|
| 700 15,6-16,4                  | 700 16,0   | 12,0<br>4,0<br>1195-1230<br>1350<br>0-1,0                       | 250 6,0            | 100 min. 7,5<br>250 5,9-6,1<br>385 425=2,0       | •                        |

Torque-control travel on flyweight assembly dimension a =

mm

Speed regulation: At

1 mm less control rod travel

### C. Settings for Fuel Injection Pump with Fitted Governor

|         | lelivery on control leve: up 40°C (104°F) | Control rod stop (3a) | Fuel deliv   | ery characteristics 3b          | Starting f | uel delivery<br>d                       |
|---------|---|-----------------------|--------------|---------------------------------|------------|---|
| rev/min | cm <sup>3</sup> /-1000 strokes            | rev/min<br>3          | rev/min<br>4 | cm³/-1000 strokes               | rev/min    | cm <sup>3</sup> /1000 strokes / mm<br>7 |
| 1100    | 113,5-120,5<br>(116,5-122,5)              | 450                   | 450          | 101,0 - 105,0<br>(99,0 - 107,0) | 100        | 140,0 - 160,0                           |

Checking values in brackets

WPP 001/4 PEN 7,0 b 2 2. Edition

En

PE 6 P 110 A 320 RS 260 W

Komb.-Nr. 0 401 876 272

RSV 250-1250 PO/374-2 R

supersedes Volvo-Penta

compan

TAMD 70 E 228 kW

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

# A. Fuel Injection Pump Settings

Port closing at prestroke

(2.75-2.95)

mm (from BDC)

| Rotational | Control rod | Fuel delivery   | Difference                       | Control rod<br>travel | Fuel delivery     | Spring pre-tensioning (torque-control valve) |
|------------|-------------|-----------------|----------------------------------|-----------------------|-------------------|--|
| rev/min    | mm 2        | cm*/100 strokes | cm <sup>1</sup> /<br>100 strokes | mm                    | cm // 100 strokes | mm<br>6                                      |
| 1000       | 12,1+0,1    | 14,1-14,3       | 0,4(0,75)                        |                       |                   |  |
| 250        | 6,1-6,3     | 1,1-1,5         | 0,3(0,6)                         |                       |                   |  |
|            |             |                 |                                  |                       |                   |  |
|            |             |                 |                                  |                       |                   |  |

Adjust the fuel delivery from each outlet according to the values in

#### **B. Governor Settings**

| Degree of<br>deflection<br>of control<br>lever | r rated speed<br>Control rod<br>travel<br>mm | rev/min<br>Control rod<br>travel<br>mm rev/min | Interme | diate rated | speed | Control-<br>lever<br>deflection<br>in degrees<br>7 | Lower<br>rev/min<br>8 | rated speed<br>Control rod<br>travel<br>mm | 11 9 1 | rque control<br>  Control rod<br>  travel<br>  mm<br>  11 |
|--|--|--|---------|-------------|-------|--|-----------------------|--|--------|---|
| loose  | 800<br>X =                                   | 0,3-1,0<br>2,0                                 | •       | -           | -     | ca.20  | 250<br>250<br>460-52  | 5.7<br>6,1-6,3                             | -      | -   |
| ca.51  | 4,0 1  | 290-1300<br>390-1420<br>0,3-1,7                |         |             |       |  | 400-72                | 0= 2,0                                     |        |   |

The numbers denote the sequence of the tests

## C. Settings for Fuel Injection Pump with Fitted Governor

| 2b Full-load stop |   | 6 Rotational-<br>speed limitat |            | nel delivery<br>paracteristics     | Starting f | uel delivery 5                                      | 4a Idle stop |                   |  |
|-------------------|---|--------------------------------|------------|------------------------------------|------------|---|--------------|-------------------|--|
| rev/min           | emp 40°C (104°F)<br>cm1/1000 strokes<br>2 | Note changed to ) rev/min 3    | rev/min    | cm <sup>1</sup> /1000 strokes<br>5 | rev/min    | cm <sup>3</sup> /1000 strokes<br>7                  | rev/min      | travel<br>mm<br>9 |  |
| LDA<br>1000       | 0,9 bar<br>141,0-143,0<br>138,0-146,0)    | 1290-1300*                     | LDA<br>700 | 0 bar<br>85,0-88,0<br>(82,0-91,0)  | 100<br>250 | 170,0-210,<br>=20,0 -<br>21,0 mm<br>RW<br>11,0-15,0 | 0 -          |                   |  |

Checking values in brackets

\* 1 mm less control rod travel than col. 2

BOSCH

ieschaftsbereich KH. Kundendionst. Kfz-Ausrustung. 1980 by Robert Bosch GmbH. Postfach 50. D-7000 Stuttgart 1. Printed in the Federal Republic of Germany nprime en Republique Fédérale d'Allemagne par Robert Bosch GmbH.

# D. Adjustment Test for Manifold Pressure Compensator

PEN 7,0 b 2 -2-

| Test: | at n |
|-------|------|

500

rev/min decreasing pressure - in bar gauge pressure

| 300           |                    |                      |   |
|---------------|--------------------|----------------------|---|
| Pump/governor | Setting            | Measurement          | diminution<br>Control rod travel-<br>difference |
|               | Gauge pressure bar | Gauge pressure = bar | mm (1)  |
| PE6PRS 260 W  | 0,90               | 0                    | 12,1-12,2<br>9,0-9,1<br>11,3-11,4               |
| +RSVP0/374~2R |                    | 0,59<br>0,30         | 9,7-9,9   |
|               |                    |                      |   |
|               |                    |                      | ·   |

Notes

(1) when n

rev/min and gauge pressure =

bar (= maximum full-load control rod travel)

Testolitico 4113

# Test Specifications Fuel Injection Pumps ① and Governors

WPP 001/4 VOL 7,0 d 1

1. Edition

PE 6 P 110 A 320 RS 272

RQV 250-1250 PA 235-2 R

Komb.-Nr.0 401 846 298

company Volvo TD 70 E

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

| Rotational speed | Control rod<br>travel | Fuel delivery                     | Difference                            | Control rod<br>travel | Fuel delivery                     | Spring pre-tensioning (torque-control valve) |
|------------------|-----------------------|-----------------------------------|---------------------------------------|-----------------------|-----------------------------------|--|
| rev/min          | mm<br>2               | cm <sup>3</sup> /100 strokes<br>3 | cm <sup>3</sup> /<br>100 strokes<br>4 | mm<br>2               | cm <sup>3</sup> /100 strokes<br>3 | mm<br>6                                      |
| 700              | 8,7-8,8               | 9,2-9,4                           | 0,4(0,8)                              |                       |                                   | 2,5±0,1                                      |
| 250              | 6,7-6,9               | 2,2-2,6                           | 0,3(0,6)                              |                       |                                   | (2,2-2,9)                                    |
|                  |                       |                                   |                                       |                       |                                   |  |
|                  |                       |                                   |                                       |                       | 1                                 |  |

Adjust the fuel delivery from each outlet according to the values in

#### **B. Governor Settings**

| Upper rated s         | peed  |  | Int  | termediate | rated spe | ed                            | Lower rated                           | speed   |                               | Sliding sleeve travel    |                                      |  |
|-----------------------|---|--|------|------------|-----------|-------------------------------|---------------------------------------|---------|-------------------------------|--------------------------|--------------------------------------|--|
| deflection of control | rev/min<br>Control<br>rod travel<br>mm<br>2 | COO C                                      | ン de |            |           | Control rod<br>travel<br>mm 4 | Degree of deflection of control lever | rev/min | Control rod<br>travel<br>mm 3 | rev/min<br>10            | mm<br>11                             |  |
| max.                  | 7,7<br>4,0<br>1450                          | 15,2-17,0<br>1290-130<br>1340-137<br>0-1,0 | 0    | •          | -         | -                             |                                       | 250     | min.8,2<br>6,7-6,9<br>10=2,0  | 200<br>550<br>900<br>250 | 0,3-0,8<br>2,6-3,2<br>4,6-5,0<br>7,5 |  |
|                       | 1430  | 0-1,0                                      |      |            |           |                               | 39                                    |         |                               |                          |                                      |  |

Torque control travel a = mm

## C. Settings for Fuel Injection Pump with Fitted Governor

| Full-load d<br>Control-ro<br>Test oil ter |                                     | Rotational-speed 2b limitation speed | Fuel deliv | ceed (c)                          | Starting<br>Idle<br>switchir | . 0  | Torque-<br>travel | Control cod |
|---|-------------------------------------|--------------------------------------|------------|-----------------------------------|------------------------------|--|-------------------|-------------|
| rev/min                                   | cm³/1000 strokes                    | rev/min 🎂                            | rev/min    | cm <sup>3</sup> /1000 strokes     | rev/min                      | cm <sup>3</sup> /1000 strokes                      | rev/min           | ICIN)       |
| 1   | 2                                   | 3                                    | 4          | 5                                 | 6                            | 7  | 8                 | 9           |
| LDA<br>700                                | 0,7 bar<br>92,0-94,0<br>(89,0-97,0) | 1290-1300*                           | LDA<br>700 | 0 bar<br>70,5-73,5<br>(67,5-76,5) | 100                          | 140,0-180,0<br>(136,0-184,0<br>=20,0-21,0<br>mm RW |                   | -           |

Checking values in brackets

\* 1 mm less control rod travel than col 2

# D. Adjustment Test for Manifold Pressure Compensator

VOL 7,0 d 1

- 2 -

| Tes | st a | ŧn | • |
|-----|------|----|---|

500

rev/min decreasing pressure - in bar gauge pressure

| Pump/governor                    | Setting              | Measurement          | diminution Control rod travet- difference |
|----------------------------------|----------------------|----------------------|---|
|                                  | Gauge pressure : bar | Gauge pressure = bar | mm (1) .                                  |
| PŁ 6 P RS 272<br>+RŲV PA 235-2 R | 0 <b>,</b> 70        | 0<br>0,31<br>0,23    | 8,7-8,8<br>7,8-7,9<br>8,5-8,6<br>7,9-8,1  |

#### Notes

(1) when n

rev/min and gauge pressure =

bar (# maximum full-load control rod travel)

# **Test Specifications** Fuel Injection Pumps 1 t/PP 001/4 MB 11,8h and Governors

3. Edition

Testoil-ISO 4113

PE 6 P 100 A 720 RS 279 Komb.-Nr. 0 401 846 442 POV 300-1100 PA 550

supersedes.83 companyDaimler Benz OM 355 engine: 177 kW (241 PS)

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

### A. Fuel Injection Pump Settings

| Port closing at pres | troke (                          | (2,75-2,95) mm (from BDC) PN= 9,0 - 12,0 mm        |   |                                  |  |  |  |  |  |  |
|----------------------|----------------------------------|--|---|----------------------------------|--|--|--|--|--|--|
|                      | Control rod<br>travel<br>mm<br>2 | Fuel delivery<br>cm <sup>3</sup> /100 strokes<br>3 | Difference<br>cm <sup>3</sup> /<br>100 strokes<br>4 | Control rod<br>travel<br>mm<br>2 | Fuel delivery<br>cm <sup>3</sup> /100 strokes<br>3 | Spring pre-tensioning<br>(torque-control valve)<br>mm<br>6 |  |  |  |  |
| 1100                 | 12,7                             | 11,7 - 11,9  | 0,3(0,5)  |                                  |  |  |  |  |  |  |
| 300                  | +0,1<br>8,0-8,2                  | 1,5 - 2,0  | 0,3(0,5)  |                                  |  |  |  |  |  |  |

Adjust the fuel delivery from each outlet according to the values in [

### **B.** Governor Settings

| peed      |  |  | Intermediate   | rated sp  | eed                             | Lower rated  | speed   |  | Sliding sleeve travel  |  |  |
|-----------|--|--|--|---|---------------------------------|--|---|--|--|--|--|
| rodtravel | travel   |  | deffection<br>of control   |   | Control rod<br>travel           | Degree of deflection of control  | rev/min   | travel   | rev/min  | (1)  |  |
| 2         | revimin (  | 29   | 4  | 5   | 6                               | 7  | В   | 9  | 10   | 11   |  |
| 1100      | 15,2-17,   | В  | -  | -   | -                               | ca.12  | 100   | min.9,5  |  | 1,4-1,5  |  |
|           |  | _  |  |   |                                 | 1  | 300   | 8,0-8,2  | 450  | 2,7-3,0  |  |
| 11,7      | 1140-115<br> 12 <i>35</i> -126                                     | 50<br>65   |  |   |                                 |  |   |  | 1150   | 8,7  |  |
| 1350      | 0 - 1,   | ,0   |  |   |                                 | 330-43   |   |  |  |  |  |
|           | rev/min<br>Control<br>rod travel<br>mm<br>2<br>1100<br>11,7<br>4,0 | rev/min Control rod (rod travel mm rev/min 2 3 1100 15,2-17,3 11,7 11,7 12,35-12 | rev/min Control rod (a) travel rod travel mm rev/min 2 3 1100 15,2-17,8 11,7 11,7 11,7 12,35-12,65 | Control rev/min Control rod (a) Degree of deflection of control rev/min 2 2 1100 15,2-17,8 -11,7 11&9-1150 4,0 12,35-1265 | Control rev/min   Control rod ( | rev/min Control rod (a) Degree of deflection of control rev/min (2a) rev/min (2a) (3 a) 1100 15,2-17,8 | rev/min Control rod travel rod travel rev/min 2 | Control rod travel   Control rev/min   Control rod travel   Control rev/min   Control rod travel   Control rod | Control rod fravel   Control | Control rod (rave)   Control rod (a)   Control rod (rave)   Control ro |  |

Torque control travel a

# C. Settings for Fuel Injection Pump with Fitted Governor

| Full-load d<br>Control-ro<br>Test oil ter |                              | Rotational-speed (2b) limitation intermediate speed | Fuel deliv | rery characteristics (5a)     | Starting<br>Idle<br>switchir |                             | Torque-<br>travel | Control cod  |  |
|---|------------------------------|---|------------|-------------------------------|------------------------------|-----------------------------|-------------------|--------------|--|
| rev/min                                   | cm³/1000 strokes             | rev/min 4e  | rev/min    | cm <sup>3</sup> /1000 strokes | rev/min                      | cm³/1000 strokes            | rev/min           | travel<br>mm |  |
| 1   | 2                            | 3   | 4          | 5                             | 6                            | 7                           | 8                 | 9            |  |
| 1100                                      | 117,0-119,0<br>(115,0-121,0) | 1140-1150*  | -          | -                             | 100                          | 140,0-160,0<br>(136,0-164,0 | ) -               | -            |  |
|   |                              |   |            |                               | 100                          | -220 (80 <b>-</b> 240)      |                   |              |  |

Chocking values in brackets

\* 1 mm less control rod travel than col 2

WPP 001/4 ROL 16,2 b

1. Edition

PE 8 P 110 A 920/4 RS 290

RQV 350/575-750 PA 273 R

Komb.-Nr. 0 401 848 044

1-6-2-5-8-3-7-4 je  $45^{\circ} \pm 0.5^{\circ} (\pm 0.75^{\circ})$ 

supersedes.

company Rolls Royce

engine: C 8 T

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

## A. Fuel Injection Pump Settings

| Port closing at pres Rotational speed rev/min | Control rod<br>travel<br>mm | 2,5-2,6<br>(2,45-2,65)<br>Fuel delivery<br>cm <sup>3</sup> /100 strokes<br>3 | Difference cm³/ 100 strokes | RW=9 0-<br>Control rod<br>travel<br>mm | Fuel delivery  cm <sup>3</sup> /100 strokes 3 | Spring pre-tensioning<br>(torque-control valve)<br>mm |
|---|-----------------------------|--|-----------------------------|--|---|---|
| 700   | 13,7+0,1                    | 17,6-17,9  | 0,4(0,75)                   |  |   |   |
| 350   | 7,0-7,2                     | 1,8-2,2  | 0,3(0,6)                    |  |   |   |
|   |                             |  |                             |  |   |   |
|   |                             |  |                             |  |   |   |

Adjust the fuel delivery from each outlet according to the values in

### **B. Governor Settings**

| Upper rated s Degree of deflection of control lever | rev/min<br>Control<br>rod travel | Control rod<br>travel<br>mm<br>rev/min | <b>(9)</b> | Intermediate<br>Degree of<br>deflection<br>of control<br>lever |   | Control rod<br>travel | Lower rated Degree of deflection of control lever 7 | speed<br>rev/min<br>B | Control rod travel             |                                 | mm<br>11                             |
|---|----------------------------------|--|------------|--|---|-----------------------|---|-----------------------|--------------------------------|---------------------------------|--------------------------------------|
| ca. 68  | 12,7<br>4,0<br>950               | 750-755<br>790-800<br>0-1,0            |            | -  | • | -                     | ca. 15  | 350                   | min. 8,5<br>7,0-7,2<br>540=2,0 | 320<br>400<br>500<br>650<br>750 | 0,5-1,7<br>1,9-2,1<br>4,6-5,2<br>8,3 |

Torque control travel a =

mm

# C. Settings for Fuel Injection Pump with Fitted Governor

| Full-load de<br>Control-roi | stop                                      | Rotational-speed 2b limitation | Fuel deliv | peed (E) | Starting<br>Idle<br>switchin |             | Torque-<br>travel | Control rod |
|-----------------------------|---|--------------------------------|------------|----------|------------------------------|-------------|-------------------|-------------|
| rev/min                     | np 40°C (1:u4°F) (2)<br>c/n³/1000 strokes | rev/min 49                     |            | Ų.       | rev/min                      |             | rev/min           | travel      |
| 1                           | 2   | 3                              | 4          | 5        | 8                            | 7           | 8                 | 9           |
| 700                         | 176,0-179,0<br>(173,5-181,5)              | 750-755 *                      | -          | ~        | 100                          | 210,0-230,0 | -                 | -           |

Checking values in brackets

\* 1 mm less control rod travel than col. 2

WPP 001/4 MAN 11,1 s

2. Edition

PES 6 P 110 A 720 LS 295

ROV 250-1100 PA 373 DR

Komb.-Nr. 0 402 046 170

0

supersede#0.83

company MAN

engine D 2566 MT

206 kW/2200 min<sup>-1</sup> MAN-Nr. 1-7961

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

### A. Fuel Injection Pump Settings

| Port closing at pres | TO DE CO.             | 3,0 = 3, i<br>2 05 3 15)     | mm (from BDC)                    | RW = 9.0              | ) - 12.0 mm                  |  |
|----------------------|-----------------------|------------------------------|----------------------------------|-----------------------|------------------------------|--|
| Rotational speed     | Control rod<br>travel | Fuel delivery                | Difference                       | Control rod<br>travel | Fuel delivery                | Spring pre-tensioning (torque-control valve) |
| rev/min              | mm .                  | cm <sup>3</sup> /100 strokes | cm <sup>3</sup> /<br>100 strokes | mm                    | cm <sup>3</sup> /100 strokes | mm   |
| 1                    | 2                     | 3                            | 4                                | 2                     | 3                            | 6  |
| 1100                 | 12,1+0,1              | 14,5-14,8                    | 0,4(0,8)                         |                       |                              |  |
| 250                  | 6,8-7,0               | 1,2-1,7                      | 0,45(0,75)                       |                       |                              |  |
|                      | 1                     |                              |                                  |                       | 1                            |  |
|                      |                       |                              |                                  |                       |                              |  |
|                      |                       |                              |                                  | l                     |                              |  |

Adjust the fuel delivery from each outlet according to the values in

#### **B.** Governor Settings

| deflection | rev/min | Control rod travel mm rev/min 2a               | Intermediate<br>Degree of<br>deflection<br>of control<br>lever | rated spores | Control rod<br>travel<br>mm 4 | Lower rated<br>Degree of<br>deflection<br>of control<br>lever<br>7 | speed<br>rev/min<br>8 | Control rod travel 3          | Sliding s<br>rev/min<br>10 | mm                                   |
|------------|---------|--|--|--------------|-------------------------------|--|-----------------------|-------------------------------|----------------------------|--------------------------------------|
| max.       | 11,1    | 15,2-17,8<br>1140-1150<br>1280-1310<br>0 - 1,0 | -  | •            | -                             | ca. 13   |                       | min.8,5<br>6,8-7,0<br>580=2,0 | 500                        | 0,6-0,8<br>3,9-4,1<br>5,5-5,7<br>8,1 |

Torque control travel a = 0,7 mm

## C. Settings for Fuel Injection Pump with Fitted Governor

| Full-load de<br>Control-roo<br>Test oil terr |  | auteumediatie abeen | high idle s              | rery characteristics (50 peed (50)   | Starting<br>Idle<br>switchir | . •                           | Torque-<br>travel | Control Control rod           |
|--|--|---------------------|--------------------------|--|------------------------------|-------------------------------|-------------------|-------------------------------|
| rev/min                                      | cm <sup>3</sup> /1000 strokes  | rev/min 40          | rev/min                  | cm <sup>3</sup> /1000 strokes  | rev/min                      | cm <sup>3</sup> /1000 strokes | rev/min           | mm                            |
| 1  | 2  | 3                   | 4                        | 5  | 6                            | 7                             | 3                 | 9                             |
| LDA<br>1100<br>LDA<br>700                    | 0,7 bar<br>145,0-148,0<br>(142,5-150,5)<br>0,7 bar<br>157,0-161,0<br>(154,0-164,0) |                     | LDA<br>500<br>LDA<br>500 | 0,2 bar<br>123,0-127,0<br>(120,0-130,0<br>0 bar<br>110,0-113,0<br>(107,0-116,0 |                              | 215,0-235,0<br>(211,0-239,0)  | 700               | 12,1+0,<br>12,8+0,<br>12,3+0, |

Checking values in brackets

\* 1 mm less control rod travel than col 2

# D. Adjustment Test for Manifold Pressure Compensator

MAN 11,1 s -2-

Test at n

500 rev/min decreasing pressure - in bar gauge pressure

| Pump/governor                   | Setting              | Measurement          | Control rod travel-                                      |
|---------------------------------|----------------------|----------------------|--|
|                                 | Gauge pressure = bar | Gauge pressure = bar | difference<br>mm (1)                                     |
| PES 6 PLS 295<br>+ RQVPA 373 DR | 0,50                 | 0<br>0,20<br>0,32    | 12,8 - 12,9<br>10,9 - 11,0<br>11,5 - 11,6<br>12,2 - 12,4 |
|                                 |                      |                      |  |

Notes

(1) when n is

revimin and gauge pressure =

bar (= maximum full-load control rod travel)

WPP 001/4 MAN 11,1 s 1 2. Edition

PES 6 P 110 A 720 LS 295

ROV 250-1100 PA 421 DR

Komb.-Nr. 0 402 046 174

supersedei0.83

company: MAN

engine. D 2566 MTSF

206 kW/2200 min 1

MAN-Nr. 1-7968

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump, Settings

| Rotational speed | Control rod<br>travel | Fuel delivery  cm <sup>3</sup> /100 strokes | Difference<br>cm <sup>3</sup> /<br>100 strokes | Control rod<br>travel | Fuel delivery<br>cm <sup>3</sup> /100 strokes | Spring pre-tensioning (torque-control valve) |
|------------------|-----------------------|---|--|-----------------------|---|--|
| 1                | 2                     | 3   | 4  | 2                     | 3   | 6  |
| 1100             | 12,1+0,1              | 14,5-14,8                                   | 0,4(0,8)                                       |                       |   |  |
| 250              | 6,9-7,1               | 1,2-1,7                                     | 0,45(0,75                                      | )                     |   |  |
|                  |                       |   |  |                       |   |  |
|                  |                       |   |  |                       |   |  |

Adjust the fuel delivery from each outlet according to the values in

#### **B. Governor Settings**

| Upper rated s | peed               |                    |               | Intermediate         | rated sp | ed                |          | Lower rated          | speed   |                       | Sliding s | sleeve travel |
|---------------|--------------------|--------------------|---------------|----------------------|----------|-------------------|----------|----------------------|---------|-----------------------|-----------|---------------|
| deflection    | rev/min<br>Control | Control rod travel | (b)           | Degree of deflection |          | Control<br>travel | rod      | Degree of deflection |         | Control rod<br>travel |           | . ①           |
|               | rod travel<br>mm   | mm<br>rev/min      | (28)          | of control           | rev/min  | mm                | <b>(</b> | of control<br>lever  | rev/min | mm (3                 | ) rev/min | mm            |
| 1 .           | 2                  | 3                  | $\overline{}$ | 4                    | 5        | 6                 |          | 7                    | 8       | 9                     | 10        | 11            |
| max.          | 1100               | 15,2-17            | ,8            | -                    | -        | -                 |          | ca. 16               | 100     | min.8,5               | 200       | 0,6-0,8       |
|               |                    |                    |               | Ì                    |          |                   |          |                      | 250     | 6,9-7,1               | 500       | 3,9-4,1       |
| ca.68         | 11,1               | 1140-11            | 50            | 1                    |          | 1                 |          | 1                    | 520-    | '580=2,0              | 800       | 5,5-5,7       |
|               | 4.0                | 1245-12            | 75            |                      | l        | l                 |          | i                    |         |                       | 1100      | 8,1           |
|               | 1400               | 0 - 1              | ,0            | ·                    |          |                   |          |                      |         |                       |           |               |
|               |                    |                    |               |                      |          |                   |          | <b>@</b>             |         |                       |           |               |
| ļ             |                    |                    |               |                      |          |                   |          | 39                   |         |                       |           | <u> </u>      |

Torque control travel a = 0,7 mm

## C. Settings for Fuel Injection Pump with Fitted Governor

| Full-load d<br>Control-ro<br>Test oil ter |  | Rotational-speed 2b limitation intermediate speed | Fuel delivingh idle s    | very characteristics 50 peed 50  | Starting<br>Idle<br>switchir | . •                           | Torque-<br>travel | control 5  Control rod        |
|---|--|---|--------------------------|--|------------------------------|-------------------------------|-------------------|-------------------------------|
| rev/min                                   | cm³/1000 strokes   | rev/min 49  | rev/min                  | cm <sup>3</sup> /1000 strokes<br>5   | rev/min                      | cm <sup>3</sup> /1000 strokes | rev/min           | travel<br>mm                  |
| LDA<br>1100<br>LDA<br>700                 | 0,7 bar<br>145,0-148,0<br>(142,5-150,5)<br>0,7 bar<br>157,0-161,0<br>(154,0-164,0) |   | LDA<br>500<br>LDA<br>500 | 0,2 bar<br>123,0-127,0<br>(120,0-130,0<br>0 bar<br>110,0-113,0<br>(107,0-116,0 |                              | 215,0-235,0<br>(211,0-239,0   | 700               | 12,1+0,<br>12,8+0,<br>12,3+0, |

Checking values in brackets

\* 1 mm less control rod travel than col 2

## D. Adjustment Test for Manifold Pressure Compensator

MAN 11,1 s 1 -2-

Testatn -

500

rev/min decreasing pressure – in bar gauge pressure

| Pump/governor                   | Setting            | Measurement          | diminution<br>Control rod travel-<br>difference         |
|---------------------------------|--------------------|----------------------|---|
|                                 | Gauge pressure bar | Gauge pressure = bar | mm (1) .  |
| PES 6 PLS 295<br>+ RQVPA 421 DR | 0,50               | 0<br>0,20<br>0,32    | 12,8 -12,9<br>10,9 - 11,0<br>11,5 - 11,6<br>12,2 - 12,4 |
|                                 |                    |                      |   |

Notes

(1) when n

rev/min and gauge pressure =

bar ( maximum full-load control rod travel)

WPP 001/4 MAN 11,1 1 8 2 Edition

PES 6 P 110 A 720 LS 295

RQ 250/1100 PA 422 DR

Komb.-Nr. 0 402 046 173

supersedes 10.83 company MAN

D 2566 MTSF 206 kW/2200 min<sup>-1</sup>

MAN-Nr. 1-7963

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke

(2.95-3.15)

mm (from BDCZy1. 6; RW = 9.0 - 12.0 mm

| Rotational speed rev/min 1 | Control rod<br>travel<br>mm<br>2 | Fuel delivery<br>cm <sup>3</sup> /100 strokes<br>3 | Difference<br>cm³/<br>100 strokes<br>4 | Control rod<br>travel<br>mm<br>2 | Fuel delivery<br>cm <sup>3</sup> /100 strokes<br>3 | Spring pre-tensioning<br>(torque-control valve)<br>mm<br>6 |
|----------------------------|----------------------------------|--|--|----------------------------------|--|--|
| 1100<br>250                | 12,1+0,1<br>6,8-7,0              |  | 0,4(0,8)<br>0,45(0,75                  |                                  |  |  |

Adjust the fuel delivery from each outlet according to the values in

### **B.** Governor Settings

|                           |                                     | Full-foad speed regulation Setting point   Test specifications   4 |                             |                                   |         | Idle speed regulation Setting point   Test specifications (5) |                                   |                    | Torque control              |                   |  |
|---------------------------|-------------------------------------|--|-----------------------------|-----------------------------------|---------|---|-----------------------------------|--------------------|-----------------------------|-------------------|--|
|                           | Control rod                         |  | Control<br>red travel<br>mm | Central<br>red travel<br>rnm<br>5 | rev/min | rev/min   | Control<br>red travel<br>emm<br>8 | rev/min<br>9       | Control rod<br>travel<br>mm | rev/min<br>11     | travel   |
| 600<br><b>V</b> H         | 19,2-20 <sub>0</sub> 8<br>= max. 46 | 600  | 20,0                        | 11,1<br>4,0<br>1350               |         |   | 6,9                               | 100<br>250<br>370- |                             | 1000<br>800       | 12,1-12,2<br>12,3-12,5<br>12,6-12,8<br>12,8-12,9 |
| Torque-control travel 0.3 |                                     | 0,3  |                             |                                   |         | 1   | 145-1                             | 160 min            |                             | 1 mm less control |  |

on flyweight assembly dimension a = Speed regulation: At C. Settings for Fuel Injection Pump with Fitted Governor

|                           | elivery on ontrol lever pp 40°C (104°F)  | Control rod stop 3a | Fuel deliv               | ery characteristics 3b   | Starting fi<br>Idle spee | uel delivery d Control             |
|---------------------------|--|---------------------|--------------------------|--|--------------------------|------------------------------------|
| rev/min                   | cm <sup>3</sup> /-1000 strokes   | rev/min<br>3        | rev/min<br>4             | cm <sup>3</sup> /-1000 strokes   | rev/min<br>6             | cm <sup>3</sup> /1000 strokes:/ mm |
| LDA<br>1100<br>LDA<br>700 | 0,7 bar<br>145,0-148,0<br>(142,5-150,5)<br>0,7 bar<br>157,0-161,0<br>(154,0-164,0) | -                   | LDA<br>500<br>LDA<br>500 | 0,2 bar<br>123,0-127,0<br>(120,0-130,0)<br>0 bar<br>110,0-113,0<br>(107,0-116,0) | 100                      | 215,0-235,0<br>(211,0-239,0)       |

Checking values in brackets

7.84

rod travel

# D. Adjustment Test for Manifold Pressure Compensator

est at n - 500 rev/min increasing pressure - in bar gauge pressure

| Pump/governor                  | Setting          |     | Measurement         | diminution Control rod travel difference                 |  |  |
|--------------------------------|------------------|-----|---------------------|--|--|--|
|                                | Gauge pressure = | bar | Gauge pressure = ba | r mm (1) .   |  |  |
| PES 6 PLS 295<br>+ RQPA 422 DR | 0,50             |     | 0<br>0,20<br>0,32   | 12,8 - 12,9<br>10,9 - 11,0<br>11,5 - 11,6<br>12,2 - 12,4 |  |  |
|                                |                  |     |                     |  |  |  |

Notes

(1) when n

rev/min and gauge pressure =

bar (= maximum full-load control rod travel)

-2-

MAN 11,1 1 8

# Test Specifications Fuel Injection Pumps (A) and Governors

40

WPP 001/4 BET 12,0 a 1

1. Edition

En

PE 6 P 110 A 320 RS 350

RSV 300-1100 P 1/815 DR

Komb.-Nr. 0 401 876 210

supersedra Berliet company MDS 063540 T engine 256 PS

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

### A. Fuel Injection Pump Settings

Port closing at prestroke

Testoil-ISO 4113

1,3-1,4 (1,25-1,45) mm (from BDC)Zy1. 3

| Rotational<br>speed<br>rev/min<br>1 | Control rod travel | Fuel delivery<br>cm <sup>1</sup> /100 strokes<br>3 | Difference<br>cm <sup>-/</sup><br>100 strokes<br>4 | Control rod<br>travel<br>mm<br>2 | Fuel delivery<br>cm //100 strokes<br>3 | Spring pre-tensioning (torque-control valve) mm |
|-------------------------------------|--------------------|--|--|----------------------------------|--|---|
| 1100                                | 11,7+0,1           | 14,5-14,8  | 0,4(0,8)   |                                  |  |   |
| 300                                 | 6,8-7,0            | 0,7-1,5  | 0,4(0,7)   |                                  |  |   |
| ,                                   |                    |  | Ì  |                                  |  |   |
|                                     |                    |  |  |                                  |  |   |

Adjust the fuel delivery from each outlet according to the values in

### **B.** Governor Settings

|                                 |                      | ed speed rev/min Intermediate rated speed ntrol rod   Control rod |       |        | speed  | Control-            |                     | rated speed<br>Control rod   | Torque control Control rod |                        |  |
|---------------------------------|----------------------|---|-------|--------|--------|---------------------|---------------------|------------------------------|----------------------------|------------------------|--|
| Degree of deflection of control | travel<br>mm         | travel<br>mm rev/min  |       |        |        | lever<br>deflection | rev/min             | travel<br>mm                 | fev/min                    | travel<br>mm           |  |
| lever<br>1                      | 2                    | 3   | 4     | 5      | 6      | in degrees<br>7     | 8                   | 9                            | 10                         | 11                     |  |
| ca. 60                          | 1085<br>1140<br>1180 | 16,0<br>10,2<br>5,0   | witho | out au | xilia  | ca. 27<br>y spring  | וויייין             | 6,4<br>min.19,0              | 1100<br>900                | 11,7-11,8<br>12,9-13,1 |  |
| 29                              | 1145<br>1200<br>1300 | 10,7<br>ca. 4,0<br>0,3-1,7  | with  | auxil  | iary s | pring               | 300<br>520-5<br>600 | 6,8-7,0<br>80=2,0<br>. 0-1,0 | 650                        | 13,3-13,4              |  |

The numbers denote the sequence of the tests

### C. Settings for Fuel Injection Pump with Fitted Governor

|             | ull load stop<br>emp_40°C (104°F)       | 6 Rotational-<br>speed irritat | Fuel delivery characteristics |   | Starting f   | uel delivery 5                     | 1dle stop |                   |  |
|-------------|---|--------------------------------|-------------------------------|---|--------------|------------------------------------|-----------|-------------------|--|
| rev/min     | cm <sup>1</sup> /1000 strokes           | changed to ) rev/min 3         | rev/min<br>4                  | cm <sup>1</sup> /1000 strokes<br>5      | rev/min<br>6 | cm <sup>1</sup> /1000 strokes<br>7 | _         | travel<br>mm<br>9 |  |
| LDA<br>1100 | 0,7 bar<br>145,0-147,5<br>(142,0-150,5) | 1140-1150*                     | LDA<br>650                    | 0,7 bar<br>174,0-179,0<br>(171,0-182,0) | 100          | 160,0-180                          | ,0 300    | 6,9               |  |
| LDA<br>900  | 0,7 bar<br>165,0-171,5<br>(162,0-174,5) |                                | LDA<br>350                    | 0 bar<br>109,0-113,0<br>(106,0-116,0)   |              |                                    |           |                   |  |

Checking values in brackets

\* 1 mm less control rod travel than col 2

**BOSCH** 

Geschaftsbereich KH Kundendienst Kfz-Ausrustung

1980 by Robert Bosch GmbH, Postfach 50, D-7000 Stuftgart 1 Printed in the Federal Republic of Germany

BET 12,0 a 1 - 2 -

Test at n =

500

rev/min decreasing pressure - in bar gauge pressure

| Pump/gavernor                    | Setting              | Measurement          | diminution<br>Control rod travel-<br>difference  |
|----------------------------------|----------------------|----------------------|--|
|                                  | Gauge pressure = bar | Gauge pressure = bar | mm (1) .   |
| PE 6 P RS 350<br>+ RSV P1/815 DI | 0,68                 | 0,42<br>0,22<br>0    | 13,4-13,5<br>12,6-12,7<br>11,6-11,9<br>11,1-11,2 |

Notes

(1) when n =

rev/min and gauge pressure =

## **Test Specifications** Fuel Injection Pumps (A) and Governors

WPP 001/4 BET 12,0 b

1. Edition

PE 6 P 110 A 320 RS 350 Komb.-Nr. 0 401 876 211

RSV 300-1100 P 1/816 DR

supersede Berliet MDS 063540 206 kW

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

### A. Fuel Injection Pump Settings

Port closing at prestroke

Testoil-ISO 4113

(1,25-1,45)

mm (from BDC; RW=9,0-12,0 mm - Zy1. 3

| Rotational<br>speed<br>rev/min | Control rod<br>travel | Fuel delivery | Oifference<br>cm <sup>-/</sup><br>100 strokes | Control rod<br>travel<br>mm | Fuel delivery<br>cm/100 strokes | Spring pre-tensioning<br>(torque-control valve)<br>mm |
|--------------------------------|-----------------------|---------------|---|-----------------------------|---------------------------------|---|
| 1100                           | 12,7+0,1              | 16,7-16,9     | 0,4 (0,75)                                    | 2                           | 3                               | 6   |
| 300                            | 6,8-7,0               | 0,9-1,7       | 0,45(0,75)                                    |                             |                                 |   |
|                                |                       |               |   |                             |                                 |   |

Adjust the fuel delivery from each outlet according to the values in E

### **B.** Governor Settings

| Degree of deflection of control lever | r rated speed<br>Control rod<br>travel<br>mm |                                   | Interme | diale rated | speed | Control-<br>lever<br>deflection<br>in degrees<br>7 |                      | raled speed<br>Control rod<br>travel<br>mm | 3 To                | rque control<br>Control rod<br>travel<br>mm |
|---------------------------------------|--|-----------------------------------|---------|-------------|-------|--|----------------------|--|---------------------|---|
| loose                                 | 800<br>x =                                   | 0,3-1,0<br>4,5                    | -       | -           | -     | ca. 24   | 300<br>300<br>480-54 | 6,4<br>6,8-7,0<br>0=2,0                    | 1100<br>1000<br>700 | 12,7-12,8<br>12,9-13,1<br>13,5-13,7         |
| ca. 59                                | 11,7<br>4,0<br>1300                          | 1140-1150<br>1200-1230<br>0,3-1,7 |         |             |       |  |                      |  |                     |   |

The numbers denote the sequence of the tests

### C. Settings for Fuel Injection Pump with Fitted Governor

|             | II load stop                                | 6 Rotational-<br>speed limital | 11.3411                  | iet delivery ,   | Starting f   | uel delivery 5                     | 4a) Idle stop |              |  |
|-------------|---|--------------------------------|--------------------------|--|--------------|------------------------------------|---------------|--------------|--|
|             | emp 40° C (104° F)<br>cm*/1000 strokes<br>2 | Note changed to ) rev/min      | rev/min                  | cm <sup>1</sup> /1000 strokes<br>5   | rev/min<br>6 | cm <sup>1</sup> /1000 strokes<br>7 | rev/min<br>8  | travel<br>mm |  |
| LDA<br>1100 | 0,7 bar<br>166,5-168,5<br>(164,0-171,0)     | 1140-1150*                     | LDA<br>650<br>LDA<br>350 | 0,7 bar<br>180,0-185,0<br>(177,0-188,0)<br>0 bar<br>109,0-113,0<br>(106,5-115,5) | 100          | 160,0-180<br>(156,0-184            |               | 6,9          |  |

Checking values in brackets

\* 1 mm less control rod travel than col 2

вет 12,0 ъ

- 2 -

| ¥ | -4 | _ |  |
|---|----|---|--|
|   |    |   |  |

500

rev/min decreasing pressure - in bar gauge pressure

| Pump/governor                   | Setting              | Measurement          | diminution Control rod travel- difference          |
|---------------------------------|----------------------|----------------------|--|
|                                 | Gauge pressure = bal | Gauge pressure = bar | mm (1) .   |
| PE 6 P RS 350<br>+RSV P1/816 DR | 0,70                 | 0<br>0,38<br>0,22    | 13,5-13,7<br>10,7-10,8 *<br>12,8 12,9<br>11,4-11,7 |

Notes

(1) when n

gauge pressure :

bar ( = maximum full-load control rod travel)

B16

2

# **Test Specifications** Fuel Injection Pumps 2 and Governors

WPP 001/4MB11, 4b 5. Edition

Testoil-ISO 4113

PES 6 P 100 A 820 LS 351% ..LS 351Y

RQ 300/1100 PA327R (1) PA327R (2) supersedes 10.83 company Daimler-Benz OM 407

147kW (200PS)

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke

(2.95-3.13)

mm (from BDC)

Zy1. 6

| 10,4 | 0.3(0.6) | 44 7 44  | 0.0.10.1      |  |
|------|----------|--|---------------|--|
|      | 0,0(0,0) | <del>                                     </del> | 8 9,9 - 10, 1 |  |
| 1,2  | 0,3(0,5) | 7,5-7,7  | 0,5 - 1,1     |  |
|      | 1        |  |               |  |
|      | 1,2      | 1,2  | 1,2           |  |

Adjust the fuel delivery from each outlet according to the values in

**B. Governor Settings** 

327R mit Z

| PRG ched |                                  | Full-load<br>Setting |                         | Test spe                          | cifications (4)                   | Idle spec    | -          |              | cifications 5                | Torque d      | Control rod      |
|----------|----------------------------------|----------------------|-------------------------|-----------------------------------|-----------------------------------|--------------|------------|--------------|------------------------------|---------------|------------------|
|          | Control rod<br>travel<br>mm<br>2 | rev/min              | Control red travel room | Control<br>rad travel<br>rnm<br>5 | rev/min<br>6                      | rev/min<br>7 | red travel | rev/min<br>9 | travel                       | rev/min<br>11 | travel           |
| 500      | 13,8-14,6                        | 500                  | 14,2                    |                                   | 1145-1160<br>1200-1230<br>0 - 1,0 | 300          | 7,6        |              | min.9,6<br>7,5-7,7<br>10=2,0 | -             | -                |
| Torque-c | ontrol travel                    |                      |                         |                                   |                                   |              | <u> </u>   | 1145-        | 1160 min                     | -             | 1 mm less contro |

Torque-control travel on flyweight assembly dimension a =

### C. Settings for Fuel Injection Pump with Fitted Governor

| Full-load d<br>governor of<br>Test oil ter | elivery on control lever np. 40°C (104°F) | Control rod stop 3a | Fuel delivery characteristics |                                     |   | Control      |   |  |
|--|---|---------------------|-------------------------------|-------------------------------------|---|--------------|---|--|
| rev/min<br>1                               | cm <sup>3</sup> /-1000 strokes<br>2       | rev/min<br>3        | rev/min                       | cm <sup>3</sup> /-1000 strokes<br>5 |   | rev/min<br>6 | red travel<br>cm <sup>3</sup> /1000 strokes:/ mm<br>7 |  |
| "Z"<br>1100                                | 102,0 - 104,0<br>(100,0 - 106,0)          | 500                 | -                             | -                                   |   | 100          | 145.0-165,0<br>(141,0-169,0)                          |  |
|  |   |                     |                               |                                     | • |              |   |  |

Checking values in brackets

| Chec<br>PRG | ched | Control rod<br>travel | Full-toad<br>Setting por |      | Test spe | rev/min                           | Idle spec | Control<br>rod travel | Test spe | Control rod                   | rev/min | Control rod 3 |
|-------------|------|-----------------------|--------------------------|------|----------|-----------------------------------|-----------|-----------------------|----------|-------------------------------|---------|---------------|
| 50          | 00   | 13,8-14,6             | 500                      | 14,2 |          | 1145-1160<br>1200-1230<br>0 - 1,0 |           | 7,6                   | 300      | min.9,6<br>7,5-7,7<br>410=2,0 | -       | -             |

Torque-control travel on flyweight assembly dimension a =

mm

Sied regulation A1145-1160 min-1

1 mm less control

### C. Settings for Fuel Injection Pump with Fitted Governor

|             | elivery on ontrol lever on 40°C (104°F) | Control rod stop 3a | Fuel deliv | ery characteristics (               | コレハ | Starting fi<br>Idle spee | uel delivery d Control             |
|-------------|---|---------------------|------------|-------------------------------------|-----|--------------------------|------------------------------------|
| rev/min     | cm <sup>3</sup> /-1000 strokes<br>2     | rev/min<br>3        | rev/min    | cm <sup>3</sup> /~1000 strokes<br>5 | - 1 | rev/min<br>6             | cm <sup>3</sup> /1000 strokes / mm |
| "y"<br>1100 | 99,0 - 101,0<br>(97,0 - 103,0)          | . 500               | -          | •                                   |     | 100                      | 130,0-150,0<br>(126,0-154,0)       |
|             |   |                     |            |                                     |     |                          |                                    |

Checking values in brackets

# Testoil-ISO 4113

### **B. Governor Settings**

| Checkin<br>PRG che |                             | Full-load :<br>Setting po | int                          | Test spe                    | cifications ( | 4) | Idle spec | oint                         |         | cifications (5)             | Torque o | (                     | 3) |
|--------------------|-----------------------------|---------------------------|------------------------------|-----------------------------|---------------|----|-----------|------------------------------|---------|-----------------------------|----------|-----------------------|----|
| rev/min            | Control rod<br>travel<br>mm | rev/min                   | Control<br>rod travel<br>rom | Control<br>rod travel<br>mm | rev/min       |    | rev/min   | control<br>rod travel<br>rnm | rev/min | Control rod<br>travel<br>mm | rev/min  | Control rod<br>travei |    |
|                    |                             |                           |                              | 5                           |               |    |           | <u> </u>                     |         |                             | •        | 12                    |    |
|                    |                             |                           |                              |                             |               |    |           |                              |         |                             |          |                       |    |
|                    |                             |                           |                              |                             |               |    |           |                              |         | ./.                         |          |                       |    |

Torque-control travel on flyweight assembly dimension a -

mm

Speed regulation At

1 mm less control rod travel

### C. Settings for Fuel Injection Pump with Fitted Governor

| governor | delivery on control lever mp 40°C (104°F) | Control rod stop 3a | Fuel deliv | ery characteristics            | (つに)! | Starting f |   | 6                         |
|----------|---|---------------------|------------|--------------------------------|-------|------------|---|---------------------------|
| fev/min  | cm <sup>3</sup> /-1000 strokes            | rev/min             | rev/min    | cm <sup>3</sup> /-1000 strokes |       | rev/min    |   | ontroi<br>od travel<br>nm |
|          |   |                     |            |                                |       |            | , |                           |
|          |   |                     |            |                                |       |            |   |                           |
|          |   |                     |            |                                |       |            |   |                           |
|          |   |                     |            |                                |       |            |   |                           |

En Checking values in brackets

WPP 001/4 RVI 8,8 c 1

2. Edition

RQV 275-1200 PA 648 PE 6 P 120 A 321 RS 359-1 Komb.-Nr. 0 401 856 154 Values only apply to test nozzle-and-holder assembly 1 688 901 019 and fuel-injection test tubing 1 680 750 067

supersedes 10.83 RVI company: MID 06 20 30 engine 141 kW

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

# A. Fuel injection Pump Settings

| Control rod | (3,45-3,65)<br>Fuel delivery | Difference  | Control rod   | Fuel delivery          | Spring pre-tensioning (torque-control valve) |
|-------------|------------------------------|---|---|------------------------|--|
| mm<br>2     | cm³/100 strokos<br>3         | cm <sup>3</sup> /<br>100 strokes<br>4   | mm<br>2   | cm³/100 strokes<br>3   | mm<br>6                                      |
| 10,7+0,     | 1 12,7-12,9                  | 0,5(0,9)  |   |                        |  |
| 5,6-5,      | B 1,1-1,7                    | 0,8(1,2)  |   |                        | 7  |
|             |                              |   |   |                        |  |
|             |                              |   |   |                        |  |
|             | travel mm 2 10,7+0,          | Control rod travel Fuel delivery cm <sup>3</sup> /100 strokes 3 10,7+0, 1 12,7-12,9 | Control rod travel  mm cm³/100 strokos 2  10,7+0, 1 12,7-12,9  Difference cm³/100 strokes 4  0,5(0,9) | Control rod travel  mm | Control rod travel  mm                       |

Adjust the fuel delivery from each outlet according to the values in [

#### **B. Governor Settings**

| Upper rated s | peed               |                        | Intermediate         | rated sp | eed                   | Lower rated          | speed   | •                     | Stiding s          | leeve travel              |
|---------------|--------------------|------------------------|----------------------|----------|-----------------------|----------------------|---------|-----------------------|--------------------|---------------------------|
|               | revimin<br>Control | Control rod to         | Degree of deflection |          | Control rod<br>travel | Degree of deflection |         | Control rod<br>travel |                    | ①                         |
|               | rod travel         | mm<br>rev/min (28)     | of control<br>lever  | rev/min  | mm (4)                | of control<br>lever  | rev/min | mm (3)                | rev/min            | mm                        |
| 1             | 2                  | 3                      | 4                    | 5        | 6                     | 7                    | 8       | 9                     | 10                 | 11                        |
| max.          | 1230               | 15,2-17,8              | -                    | -        | -                     | ca. 10               |         | min.8,2               | 275                | 1,3-1,4                   |
| ca. 65        | 9,7<br>4,0         | 1245-1255<br>1335-1365 |                      |          |                       | 275-36               | 275     | 5,6-5,8               | 450<br>800<br>1200 | 8,3-3,9<br>5,7-5,9<br>8,3 |
| !             | 1450               | 0-1,0                  |                      |          |                       |                      |         |                       |                    | 5,0                       |
|               |                    |                        |                      |          |                       | 39                   |         |                       |                    |                           |

Torque control travel a

### C. Settings for Fuel Injection Pump with Fitted Governor

| Full-load di<br>Control-roi<br>Test oil ten | d stop<br>np 40°C (104°F) 2 | Rotational-speed 20 Imitation intermediate speed | high idle s | very characteristics 5e peed 50 | switchin | , •                         | Torque-control (<br>travel Control r<br>travel |          |
|---|-----------------------------|--|-------------|---------------------------------|----------|-----------------------------|--|----------|
| 1   | 2                           | 3  | 4           | 5                               | A        | 7                           | 8  | 9        |
| 1200  | 127,0-129,0<br>(124,0-132,0 |  | •           | -                               | 100      | 155,0-175,0<br>(151,0-179,0 | -  | <u>-</u> |

Checking values in brackets

\* 1 mm less control rod travel than col. 2

7.84

estolled 4143

Testoil-180 4113

# Test Specifications Fuel Injection Pumps ① and Governors

WPP 001/4 PEN 7,0 k

1. Edition

PE 6 P 110 A 320 RS 367 Z Komb.-Nr. 0 401 846 456 RQV 250-1000 PA 394

eupersedes
compan¥01vo-Penta
engine MD 70 C-C

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

### A. Fuel Injection Pump Settings

| Port closing at pres | Control rod  | (2,95-3,15)<br>Fuel delivery | mm (from BDC) Difference              | Control rod | Fuet delivery                     | Spring pre-tensioning             |
|----------------------|--------------|------------------------------|---------------------------------------|-------------|-----------------------------------|-----------------------------------|
| rev/min              | travel<br>mm | cm <sup>3</sup> /100 strokes | cm <sup>3</sup> /<br>100 strokes<br>4 | mm<br>2     | cm <sup>3</sup> /100 strokes<br>3 | (forque-control valve)<br>mm<br>6 |
| 900                  | 8,9-9,0      | 7,0-7,2                      | 0,4(0,75)                             |             |                                   | 2,5 ± 0,1                         |
| 250                  | 5,3-5,5      | 1,6-2,0                      | 0,3(0,6)                              |             |                                   | (2,2-2,9)                         |
|                      |              |                              |                                       |             |                                   |                                   |
|                      |              |                              |                                       |             |                                   |                                   |

Adjust the fuel delivery from each outlet according to the values in

### **B.** Governor Settings

| Upper rated                                    | speed                                       |   |     | Intermediate                                   | rated sp     | eed                     | Lower rated   | speed        |                               | Sliding s     | iceve travel |
|--|---|---|-----|--|--------------|-------------------------|---|--------------|-------------------------------|---------------|--------------|
| Degree of<br>deflection<br>of control<br>lever | rev/min<br>Control<br>rod travel<br>mm<br>2 | Control rod<br>travel<br>mm<br>rev/min<br>3 | 0   | Degree of<br>deflection<br>of control<br>lever | rev/min<br>5 | Control rod travel mm 4 | Degree of<br>deflection<br>of control<br>lever<br>7 | rev/min<br>8 | Control rod<br>travel<br>mm 3 | rev/min<br>10 | mm<br>11     |
| max.<br>ca. 66                                 | 7,9   | 15,2-17<br>1050-10<br>1110-1                | 060 | -  | -            | -                       | ca. 10<br>250-400                                   | 100<br>250   | min.6,8<br>5,3-5,5            | 470<br>730    |              |
|  | 1250  | 0-1   | _   |  |              |                         | 39  |              |                               | 1000          | 7,9          |

Torque control travel a =

mm

### C. Settings for Fuel Injection Pump with Fitted Governor

| Full-load of<br>Control-ro<br>Test oil te |                                     | Imitation intermediate speed | Fuel deliv | <u> </u>                      | Starting<br>Idle<br>switchir | ng point                      | travel  | Control roc travel |
|---|-------------------------------------|------------------------------|------------|-------------------------------|------------------------------|-------------------------------|---------|--------------------|
| rev/min                                   | cm <sup>3</sup> /1000 strokes       | rev/min 40                   | rev/min    | cm <sup>3</sup> /1000 strokes | rev/min                      | cm <sup>3</sup> /1000 strokes | rev/min | mm                 |
| 1   | 2                                   | 3                            | 4          | 5                             | 6                            | 7                             | 8       | 9                  |
| LDA<br>900                                | 0,7 bar<br>70,0-72,0<br>(67,0-75,0) | 1050-1060*                   | -          | -                             | 100                          | 165,0-200,0<br>(161,0-204,0)  | -       | -                  |

Checking values in brackets

\* 1 mm less control rod travel than col. 2

2

Testoil-iSO

# Test Specifications 40 Fuel Injection Pumps 2 WPP 001/4 STE 10,0 b and Governors

7. Edition

PE 6 P 110 A 721 RS 369

RQ 300/1300 PA 412 DR

supersede7.83 company Steyr engine WD 615.60

Komb.-Nr. 0 401 856 142

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

### A. Fuel Injection Pump Settings

Port closing at prestroke

|                  |                       | 2,70-2,90                    |                                 |                       |                              |  |
|------------------|-----------------------|------------------------------|---------------------------------|-----------------------|------------------------------|--|
| Rotational speed | Control rod<br>travel | Fuel delivery                | Difference<br>cm <sup>3</sup> / | Control rod<br>travel | Fuel delivery                | Spring pre-tensioning (forque-control valve) |
| rev/min          | mm                    | cm <sup>3</sup> /100 strokes | 100 strokes                     | mm                    | cm <sup>3</sup> /100 strokes | mm   |
| 1                | 2                     | 3                            | 4                               | 2                     | 3                            | 6  |
| 1300             | 12,5+0,1              | 11,7-11,9                    | 0,4(0,75)                       |                       |                              |  |
| 250              | 9,0-9,2               | 1,8-2,4                      | 0,4(0,7)                        |                       |                              | C.   |
|                  |                       |                              |                                 |                       |                              |  |
|                  |                       |                              |                                 |                       | 1                            |  |
|                  |                       |                              |                                 | Ì                     |                              |  |

Adjust the fuel delivery from each outlet according to the values in

### **B.** Governor Settings

| Checkin<br>PRG che |                             | Full-load s | •                                | •                                 | cifications (4)                   | Idle spec    | -                                |              | cifications (5)             | Torque o   | control 3  |
|--------------------|-----------------------------|-------------|----------------------------------|-----------------------------------|-----------------------------------|--------------|----------------------------------|--------------|-----------------------------|------------|--|
| rev/min            | Control rod<br>travel<br>mm | rev/min     | Control<br>red travel<br>mm<br>4 | Control<br>rad travel<br>rnm<br>5 | rev/min<br>6                      | rev/min<br>7 | Centrel<br>red travel<br>mm<br>8 | rev/min<br>9 | Control rod<br>travel<br>mm | rev/min    | travel   |
| 550                | 15,6-16,4                   | 550         | 16,0                             | 11,5<br>4,0<br>1550               | 1345-1360<br>1405-1435<br>0 - 1,0 |              | 6,0                              |              | 5,9-6,1<br>30 = 2,0         | 700<br>900 | 12,5-12,6<br>12,8-12,9<br>12,6-12,8<br>12,6-12,7 |

Torque-control travel on flyweight assembly dimension a =

1345-1360 min-1

rod travel

### C. Settings for Fuel Injection Pump with Fitted Governor

|              | elivery on<br>ontrol lever<br>np 40°C (104°F) | Control rod stop | Fuel deliv | ery characteristics (3b)                | Starting f   | Contra   |
|--------------|---|------------------|------------|---|--------------|--|
| rev/min<br>1 | cm <sup>3</sup> /-1000 strokes<br>2           | rev/min<br>3     | rev/min    | cm <sup>3</sup> /-1000 strokes<br>5     | rev/min<br>6 | red travel<br>cm <sup>3</sup> /1000 strokes/ mm<br>7 |
| LDA<br>1300  | 0,7 bar<br>117,0-119,0<br>(114,0-122,0)       | -                | LDA<br>700 | 0,7 bar<br>107,0-111,0<br>(104,0-114,0) | 100          | 115,0-135,0  |
|              |   |                  | LDA        | 0 bar<br>100,0-102,0<br>(97,0-105,0)    |              |  |
|              |   |                  |            |   |              |  |

Checking values in brackets

5.84

**B21** 

STE 10,0 b

- 2 -

| T | 00 | t a | ٠ | n |
|---|----|-----|---|---|

500

rev/min decreasing pressure - in bar gauge pressure

| Pump/governor                 | Setting              | Measurement          | diminution Control rod travel- difference        |
|-------------------------------|----------------------|----------------------|--|
|                               | Gauge pressure = bar | Gauge pressure = bar | mm (1) .   |
| PE 6P RS 369<br>+RQ PA 412 DR | 0,70                 | 0<br>0,31<br>0,27    | 12,8-12,9<br>12,5-12,6<br>12,7-12,8<br>12,6-12,7 |

Notes

rev/min and gauge pressure =

<sup>· 1)</sup> when h

# Test Specifications Fuel Injection Pumps (1) and Governors

WPP 001/4 STE 10,0 b 1
1. Edition

En

PE 6 P 110 A 721 RS 369 Komb.-Nr. 0 401 856 143

RQV 250-1300 PA 413 DR

supersedes

company. Steyr

engine

WDWD 615,60

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

### A. Fuel Injection Pump Settings

| Port closing at pres |                             | 75 2 05 \                                   | mm (from BDC)                                       | RW =                             | 9,0-12,0 mm  |  |
|----------------------|-----------------------------|---|---|----------------------------------|--|--|
| Rotational speed     | Control rod<br>travel<br>mm | Fuel delivery  cm <sup>3</sup> /100 strokes | Difference<br>cm <sup>3</sup> /<br>100 strokes<br>4 | Control rad<br>travel<br>mm<br>2 | Fuel delivery<br>cm <sup>3</sup> /100 strokes<br>3 | Spring pre-tensioning<br>(torque-control valve)<br>mm<br>6 |
| 1300                 | 12,6+0,                     | 1 11,5-11,7                                 | 0,4(0,75)   |                                  |  |  |
| 250                  | 9,3-9,5                     | 1,8-2,4                                     | 0,4(0,7)  |                                  |  |  |
|                      |                             |   |   |                                  |  |  |
|                      |                             |   |   | 1                                |  |  |

Adjust the fuel delivery from each outlet according to the values in

### **B.** Governor Settings

|        |                                  |                              | Degree of | e of Control rod                  |         |         | Lower rated speed  Degree of deflection travel |                            |    | Sliding sleeve travel |                   |   |               |                    |
|--------|----------------------------------|------------------------------|-----------|-----------------------------------|---------|---------|--|----------------------------|----|-----------------------|-------------------|---|---------------|--------------------|
|        | Control<br>rod travel<br>mm<br>2 | travel<br>mm<br>rev/min<br>3 |           | deflection<br>of control<br>lever | rev/min | mm<br>6 | •  | deflect<br>of con<br>lever |    | rev/min<br>8          | travel<br>mm<br>9 | 3 | rev/min<br>10 |                    |
| max.   | 1300                             | 15,2-17                      | ,8        | •                                 | -       | -       |  | ca.                        | 15 | 100<br>250            | min10             |   | 2             | 0,6-0,8<br>3,4-4,1 |
| ca. 47 | 11,6<br>4,0<br>1550              |                              | 80        |                                   |         |         |  |                            |    |                       | 180= 2            |   |               | 5,6-6,0<br>8,3     |
|        |                                  |                              |           |                                   |         |         |  | 30                         |    |                       |                   |   |               |                    |

Torque control travel a = 0.4 mm

### C. Settings for Fuel Injection Pump with Fitted Governor

| Full-load di<br>Control-roi<br>Test oil ten |  | Rotational-speed (2b) fimilation intermediate speed (4a) | high idle s              | peed 5b  | idle<br>switchir | . •         | Torque-<br>travel | Control 5  Control rod travel            |
|---|--|--|--------------------------|--|------------------|-------------|-------------------|--|
| 1   | 2                                      | 3  | 4                        | 5  | 6                | 7           | 8                 | 9  |
| LDA<br>1300                                 | 0,7 bar<br>115,0-117,0<br>(112,0-120,0 |  | LDA<br>700<br>LDA<br>700 | 0,7 bar<br>108,0-111,<br>(105,0-114,0<br>0 bar<br>102,0-104,0<br>(99,0-107,0 | ))               | 120,0-130,0 | 700<br>1000       | 12,6+0,<br>13,0+0,<br>12,9+0,<br>12,7+0, |

Chucking values in brackets

\*1 mm less control rod travel than col 2

5.84

523

BOSCH

STE 10,0 b 1 - 2 -

| Pump/governor                | Setting            | Measurement        | diminution Control rod travel- difference        |
|------------------------------|--------------------|--------------------|--|
|                              | Gauge pressure bar | Gauge pressure bar | mm (1)   |
| PE6PRS 369<br>+RQV PA 413 DR | 0,70               | 0<br>0,35<br>0,33  | 13,0-13,1<br>12,7-12,8<br>12,9-13,0<br>12,8-12,9 |

Notes

(1) when n

rev/min and gauge pressure -

# Test Specifications Fuel Injection Pumps ① and Governors

WPP 001/4 MB 11,8 i 4. Edition

En

Testoil-ISO 4113

PE 6 P 110 A 720 RS 371 RQV 300-1100 PA 568 Komb.-Nr. 0 401 846 450 1 - 5 - 3 - 6 - 2 - 4 0 -60 -120-180-240-300  $\pm 0.5^{\circ}$  ( $\pm 0.75^{\circ}$ )

supersede2.82 company Daimler Benz OM 355 A engine. 206 kW (280 PS)

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

### A. Fuel injection Pump Settings

| Port closing at pres | troke                 | (2,75-2,95)<br>2.80-2.90          | mm (from BDC)                         |                       |                                   |  |
|----------------------|-----------------------|-----------------------------------|---------------------------------------|-----------------------|-----------------------------------|--|
| Rotational speed     | Control rod<br>travel | -                                 | Difference                            | Control rod<br>travel | Fuel delivery                     | Spring pre-tensioning (torque-control valve) |
| rev/min<br>1         | mm<br>2               | cm <sup>3</sup> /100 strokes<br>3 | cm <sup>3</sup> /<br>100 strokes<br>4 | mm<br>2               | cm <sup>3</sup> /100 strokes<br>3 | mm<br>6                                      |
| 1100                 | 11,7+0,1              | 16,0 - 16,2                       | 0,4(0,8)                              |                       |                                   |  |
| 300<br>600<br>500    | 6,1-6,3<br>           | 1,3- 1,9<br>c, sp. 4 u.5          | 0,4(0,7)<br>0,6(1,0)                  |                       |                                   |  |

Adjust the fuel delivery from each outlet according to the values in

#### **B.** Governor Settings

| Upper rated s | peed  |                                   | Intermediate                          | rated sp     | eed                           | Lower rated   | speed        |                               | Sliding s     | leeve travel                  |
|---------------|---|-----------------------------------|---------------------------------------|--------------|-------------------------------|---|--------------|-------------------------------|---------------|-------------------------------|
|               | rev/min<br>Control<br>rod travel<br>mm<br>2 | travel                            | Degree of deffection of control lever | rev/min<br>5 | Control rod<br>travel<br>mm 4 | Degree of<br>deflection<br>of control<br>lever<br>7 | rev/min<br>8 | Control rod<br>travel<br>mm 3 | rev/min<br>10 | 70<br>70m<br>11               |
| max.          | 1100  | 15,2-17,8                         | -                                     | -            | -                             | ca. 16  | 100<br>300   | min. 8,0                      | 540<br>820    | 1,0-2,0<br>4,4-4,6<br>5,9-6,2 |
| ca. 66        |   | 1140-1150<br>1215-1245<br>0 - 1,5 |                                       |              |                               | 275-330<br>③  |              |                               | 1100          | 8,4                           |

Torque control travel = = mn

### C. Settings for Fuel Injection Pump with Fitted Governor

| Full-load de<br>Contro!-red<br>Test oil ten |   | Rotational-speed 2b fimitation intermediate speed |            |   | Starting<br>Idle<br>switchir |                                | Torque-<br>travel | Control (5) Control rod travel |
|---|---|---|------------|---|------------------------------|--------------------------------|-------------------|--------------------------------|
| rev/min                                     | cm <sup>3</sup> /1000 strokes           | rev/min 48  | rev/min    | cm <sup>3</sup> /1000 strokes           | rev/min                      | cm <sup>3</sup> /1000 strokes  | rev/min           | mm                             |
| 1   | 2                                       | 3   | 4          | 5                                       | 6                            | 7                              | 8                 | 9                              |
| LDA<br>1100                                 | 0,7 bar<br>160,0-162,0<br>(157,0-165,0) | 1140-1150*  | LDA<br>600 | 0,7 bar<br>155,0-159,0<br>(152,0-162,0) | 100                          | 140, 0-160, 0<br>136, 0-164, 0 | -<br>}            | -                              |
|   |   |   | LDA<br>500 | 0 bar<br>134,0-136,0<br>(131,0-139,0)   |                              | 220 (80-240)                   |                   |                                |

Checking values in brackets

\* 1 mm less control rod travel than col 2

-2-

Testatn =

500

rev/min decreasing pressure - in bar gauge pressure

MB 11.8i

| ſ | ~        | - |
|---|----------|---|
|   | 13       |   |
|   | #        |   |
| 1 | 7        |   |
|   | Õ        |   |
| ı | <u>x</u> |   |
| 1 | <u></u>  | 1 |
| ١ | 2        | 1 |
| I | Š        | 1 |
|   | e        | ı |
| 1 |          | I |

|                | Setting  Gauge pressure > bar | Measurement  Gauge pressure = bar | Control rod travel-<br>difference<br>mm (1)              |
|----------------|-------------------------------|-----------------------------------|--|
| 371 with 568 · | 0,7 bar                       | 0,39<br>0,35<br>0                 | 11,7 - 11,8<br>11,5 - 11,6<br>11,2 - 11,3<br>11,0 - 11,1 |

Notes

(1) when n =

rev/min and gauge pressure =

# Test Specifications Fuel Injection Pumps (A) and Governors

40

WPP 001/4 DAF 11,6 i
5. Edition

PE 6 P 110 A 320 RS 372 Komb.-Nr. 0 401 876 235 RSV 250-1100 P 5/458 R

supersed19.82 compan,DAF engine DKTD 1160

Note VDT-I-420/114

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

## A. Fuel Injection Pump Settings

Port closing at prestroke (2.75-2.95)

mm (from BDC

| Rotational speed | Control rod travel | Fuel delivery    | Difference                       | Control rod<br>travel | Fuel delivery   | Spring pre-tensioning (torque-control valve) |
|------------------|--------------------|------------------|----------------------------------|-----------------------|-----------------|--|
| rev/min          | mm 2               | cm //100 strokes | cm <sup>1</sup> /<br>100 strokes | mm<br>2               | cm /100 strokes | mm<br>6                                      |
| 850              | 12,0+0,1           | 13,6-13,9        | 0,4 (0,75)                       |                       |                 |  |
| 250              | 6,6-6,8            | 0,7-1,2          | 0,45(0,75)                       |                       |                 |  |
|                  |                    |                  |                                  |                       |                 |  |
|                  |                    |                  |                                  |                       |                 |  |

Adjust the fuel delivery from each outlet according to the values in

### **B.** Governor Settings

| Degree of deflection | r rated speed<br>Control rod<br>travel<br>mm |                                   | Intermed | hate rated | speed<br>6 | Control-<br>lever<br>deliection<br>in degrees<br>7 |                       | rated speed<br>Control rod<br>travel<br>mm | 3 To<br>rev/min<br>10 | rque control<br>Control rod<br>travel<br>mm |
|----------------------|--|-----------------------------------|----------|------------|------------|--|-----------------------|--|-----------------------|---|
| loose                | 800<br>x = 3.                                | 0,3-1,0<br>5                      | -        | •          | -          | ca. 21   | 250<br>250<br>640-700 | 6,2  | 400<br>300            | 12,2-12,3<br>12,4-12,9                      |
| ca. 51               |  | 1140-1150<br>1275-1305<br>0,3-1,7 |          |            |            |  | D4U-7UU               | = 2,0                                      |                       |   |

The numbers denote the sequence of the tests

### C. Settings for Fuel Injection Pump with Fitted Governor

| (4)                         | ill-load stop                             | 6 Rotational-<br>speed limitat |            | iel delivery<br>naracteristics        | Starting t | luel delivery 5                                      | <b>43</b> Idi | e stop                           |
|-----------------------------|---|--------------------------------|------------|---------------------------------------|------------|--|---------------|----------------------------------|
| Test oil fi<br>rev/min<br>t | emp 40°C (104°F)<br>cm*/1000 strokes<br>2 | Note changed to ) rev/min 3    | rev/min    | cm <sup>3</sup> /1000 strokes<br>5    | vev/min    | cm <sup>3</sup> /1000 strokes<br>7                   | rev/min<br>8  | Control rod<br>travel<br>mm<br>9 |
| LDA<br>850                  | 0,7 bar<br>135,5-138,5<br>(133,0-141,0)   | 1140-1150 *                    | LDA<br>600 | 0 bar<br>126,0-129,0<br>(123,5-131,5) | 100        | 244,0-285<br>(240,0-28)<br>= 19,5 -<br>21,0 mm<br>RW |               | 6,7                              |

Checking values in brackets

\* 1 mm less control rod travel than col 2

5.84

**BOSCH** 

Geschaftsbereich KH. Kundendienst. Kfz-Ausrustung. 1980 by Robert Bosch GmbH. Postfach 50. D-7000 Stuttgärt 1. Printed in the Federal Republic of Germany imprime en Republique Federale d'Allemagne par Robert Bosch GmbH.

DAF 11,6 i

. 2 -

Test at n =

600

rev/min decreasing pressure - in bar gauge pressure

| Pump/governor                   | Setting              | Measurement          | diminution<br>Control rod travel-<br>difference  |
|---------------------------------|----------------------|----------------------|--|
|                                 | Gauge pressure = bar | Gauge pressure = bar | mm (1)   |
| PE 6 P RS 372<br>+ RSV P5/458 R | 0,70                 | 0<br>0,30<br>0,26    | 12,0-12,1<br>11,4-11,5<br>11,8-11,9<br>11,5-11,7 |

Notes

(1) when n

rev/min and gauge pressure =

Testoil-ISO 4113

# **Test Specifications**

**Fuel Injection Pumps** and Governors

WPP 001/4 DAF 11,6 k

5. Edition

En

supersedes 10.82

company: DAF

engine: **DKS 1160** 

235 kW (320 PS)

PE 6 P 120 A 320 RS 372 Komb.-Nr. 0 401 876 229

Note VDT-I-420/114

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

28-29

### A. Fuel Injection Pump Settings

| Rotational speed | Control rod travel | 2.75-2.95)<br>Fuel delivery       | Difference                            | Control rod<br>travel | Fuel delivery        | Spring pre-tensioning (torque-control valve) |
|------------------|--------------------|-----------------------------------|---------------------------------------|-----------------------|----------------------|--|
| rev/min<br>1     | mm<br>2            | cm <sup>3</sup> /100 strokes<br>3 | cm <sup>3</sup> /<br>100 strokes<br>4 | mm<br>2               | cm³/100 strokes<br>3 | mm<br>6                                      |
| 850              | 10,9+0,1           | 19,1 - 19,5                       | 0,5 (0,9                              |                       |                      |  |
| 250              | 6,2-6,4            | 1,1 - 1,5                         | 0,65(0,9                              | 5)                    |                      |  |

RSV 250-1100 P5/458R

Adjust the fuel delivery from each outlet according to the values in [

### **B.** Governor Settings

| Upper of deflection of control lever |                    | Control rod<br>travel<br>mm       | Intermediate<br>Degree of<br>deflection<br>of control<br>lever | rev/min | ed<br>Control rod<br>travel<br>mm<br>6 | 4 Lower<br>Degree of<br>deflection<br>of control<br>lever<br>7 |             | Control rod<br>travel | 3 Tor      | que control<br>Control rod<br>travel<br>mm<br>11 |
|--------------------------------------|--------------------|-----------------------------------|--|---------|--|--|-------------|-----------------------|------------|--|
| loose                                | 800                | 0,3 - 1,0                         | -  | -       | •                                      | ca. 24   | 250         | 5,8                   | 400<br>300 | 11,1+0,<br>11,3+0,                               |
| 10050                                | x =                | 5,0                               |  |         |  |  | 250<br>620- | 6,2-6,4 $680 = 2,0$   |            | 11,5.0,  |
| €a. 54                               | 9,9<br>4,0<br>1425 | 1140-1150<br>1260-1290<br>0,3-1,7 |  |         |  |  |             |                       |            |  |

The numbers denote the sequence of the tests

### C. Settings for Fuel Injection Pump with Fitted Governor

| 2 Full-lo                     | Full-load stop  6 Rotational-speed limitat |                                     |            | et delivery<br>practeristics          | Starting<br>Id <del>le</del> | fuel delivery  | 5e) idle stop |                                  |
|-------------------------------|--|-------------------------------------|------------|---------------------------------------|------------------------------|--|---------------|----------------------------------|
| Test oil temp<br>rev/min<br>1 | 1 .  | Note:<br>changed to<br>rev/min<br>3 | rev/min    | cm³/1000 strokes<br>5                 | rev/min<br>6                 | cm <sup>3</sup> /1000 strokes<br>7                   | rev/min<br>8  | Control rod<br>travel<br>mm<br>9 |
| LDA<br>850                    | 0,7 bar<br>191,0-195,0<br>(188,0-198,0)    | 1140-1150*                          | LDA<br>600 | 0 bar<br>135,0-137,0<br>(132,0-140,0) | 100                          | 315,0-355,0<br>(311,0-359,<br>= 19,5 -<br>21,0 mm RW | 0)            | -                                |

Checking values in brackets

1 mm less control rod travel than col. 2

Test at n = 600 rev/min decreasing pressure - in bar gauge pressure

| Pump/governor | Setting              | Measurement          | diminution , Control rod travel-difference |
|---------------|----------------------|----------------------|--|
|               | Gauge pressure = bar | Gauge pressure = bar | mm (1)                                     |
| PE6P120RS 372 | 0,36                 |                      | 10,6 - 10,7                                |
| with P5/458R  |                      | 0,70                 | 10,9 - 11,0                                |
|               |                      | 0                    | 9,8 - 9,9                                  |
|               |                      | 0,28                 | 10,0 - 10,2                                |
|               |                      |                      |  |
|               |                      |                      |  |
|               |                      |                      |  |

Notes

(1) when n =

rev/min and gauge pressure =

bar (= maximum full-load control rod travel)

DAF 11,6 k

-2-

CG.

**Festoil-iSO 4113** 

# Test Specifications Fuel Injection Pumps 2 and Governors

WPP 001/4 DAF 11,6 i 9

1. Edition

PE 6 P 120 A 320 RS 372-1 Komb.-Nr. 0 401 846 464

RO 250/1100 PA 417 R

supersedes

company. DAF

engine: DKS 1160 235 kW

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

# A. Fuel Injection Pump Settings 2,8-2,9 Port closing at prestroke (2,75-2,95)

mm (from BDC)

| Rotational speed rev/min | Control rod<br>travel<br>mm<br>2 | Fuel delivery<br>cm <sup>3</sup> /100 strokes<br>3 | Difference<br>cm³/<br>100 strokes<br>4 | Control rod<br>travel<br>mm<br>2 | Fuel delivery  cm <sup>3</sup> /100 strokes 3 | Spring pre-tensioning<br>(torque-control valve)<br>mm<br>6 |
|--------------------------|----------------------------------|--|--|----------------------------------|---|--|
| 850                      | 10,9+0,1                         | 19,3-19,7  | 0,5(0,9)                               |                                  |   |  |
| 250                      | 6,2-6,4                          | 1,1-1,5  | 0,65(0,95                              | )                                |   |  |
|                          |                                  |  |  |                                  |   |  |
|                          |                                  |  |  |                                  |   |  |

Adjust the fuel delivery from each outlet according to the values in

### **B. Governor Settings**

| Checkin  | ng of slider                     | Full-load s  | •                                 | •                                 | cifications (4)                 | Idle spec    | -                                |                    | cifications (5)                   | Torque d | control (3)            |
|----------|----------------------------------|--------------|-----------------------------------|-----------------------------------|---------------------------------|--------------|----------------------------------|--------------------|-----------------------------------|----------|------------------------|
| rev/min  | Control rod<br>travel<br>mm<br>2 | rev/min<br>3 | Control<br>rod travel<br>mrm<br>4 | Control<br>red travel<br>rnm<br>5 | rev/min                         | rev/min<br>7 | Centrol<br>rod travel<br>mm<br>8 | rev/min<br>9       | Control rod<br>travel<br>mm<br>10 | rev/min  | Control rod Control    |
| 700      | 15,6-16,4                        | 700          | 16,0                              | 9,9<br>4,0<br>1350                | 1145-1160<br>1210-1240<br>0-1,0 |              | 6,3                              | 100<br>250<br>445- | min.7,4<br>6,2-6,4<br>485 = 2,0   |          | 10,9-11,0<br>10,8-11,0 |
| Torque-c | control travel                   | ,            | 0                                 |                                   |                                 |              | 1                                | 145-1              | 160 min <sup>-1</sup>             |          | 1 mm less control      |

Torque-control travel on flyweight assembly dimension a =

Speed regulation. At

1 mm less control rod travel

### C. Settings for Fuel Injection Pump with Fitted Governor

| governor     | lelivery on control lever mp 40°C (104°F) | Control rod stop | Fuel deliv | ery characteristics                   | Starting f   | uel delivery<br>d (Control                            |
|--------------|---|------------------|------------|---------------------------------------|--------------|---|
| I<br>Iev/min | cm <sup>3</sup> /-1000 strokes            | rev/min<br>3     | rey/min    | cm <sup>3</sup> /-1000 strokes<br>5   | rev/min<br>6 | red travel<br>cm <sup>3</sup> /1000 strokes / mm<br>7 |
| LDA<br>850   | 0,7 bar<br>193,0-197,0<br>(190,0-200,0)   | -                | LDA<br>600 | 0 bar<br>133,5-137,5<br>(130,5-140,5) | 100          | 320,0-360,0<br>(316,0-364,0)<br>= 19,5-21,0<br>mm RW  |

Checking values in brackets

Test at n rev/min decreasing pressure - in bar gauge pressure

DAF 11,6 i 9

-2-

| 000                            |                      |                      |  |
|--------------------------------|----------------------|----------------------|--|
| Pump/governor                  | Setting              | Measurement          | diminution Control rod travel- difference      |
|                                | Gauge pressure = bar | Gauge pressure = bar | mm (1)   |
| PE 6 PRS 372-1<br>+ RQPA 417 R | 0,70                 | 0<br>0,30<br>0,26    | 10,9-11,0<br>9,8-9,9<br>10,6-10,7<br>10,0-10,4 |
|                                |                      |                      |  |

Notes

(1) when n

rev/min and gauge pressure =

estoil-ISO 4113

# Test Specifications Fuel Injection Pumps ② and Governors

40

WPP 001/4 DAF 11,6 i 8
3. Edition

En

PE 6 P 110 A 320 RS 372-1

Komb.-Nr. 0 401 846 463

RQ 250/1100 PA 417-1

RQ 250/1100 PA 417

supersedes 3.83

company: DAF
DKTD 1160

191 kW (260 PS)

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

#### A. Fuel Injection Pump Settings

Port closing at prestroke (2, 75-2, 95) mm (from BDC)

|                          |                                  | 2,75-2,55  |   |                                  |  |
|--------------------------|----------------------------------|--|---|----------------------------------|--|
| Rotational speed rev/min | Control rod<br>travel<br>mm<br>2 | Fuel delivery<br>cm <sup>3</sup> /100 strokes<br>3 | Difference<br>cm <sup>3</sup> /<br>100 strokes<br>4 | Control rod<br>travel<br>mm<br>2 | Spring pre-tensioning<br>(torque-control valve)<br>mm<br>6 |
| 850                      | 12,0+0,                          | 13,7-14,0  | 0,4(0,75)   |                                  |  |
| 250                      | 6,6-6,                           | 8 0,7-1,1  | 0,45(0,75   | )                                |  |
|                          |                                  |  |   |                                  |  |
|                          |                                  |  |   |                                  | <br>   |

Adjust the fuel delivery from each outlet according to the values in

### **B. Governor Settings**

| Checkin<br>PRG che |                   | Full-load sp<br>Setting poin | nt   |                       |                                   | idle spec<br>Setting p | coint<br>Central      | Test spe | cifications 5                   | Torque d      | Control rod            |
|--------------------|-------------------|------------------------------|------|-----------------------|-----------------------------------|------------------------|-----------------------|----------|---------------------------------|---------------|------------------------|
| rev/min            | travel<br>mm<br>2 | 1                            |      | red travel<br>mm<br>5 | rev/min<br>6                      | rev/min<br>7           | ned travel<br>mm<br>8 |          | travel<br>mm<br>10              | rev/min<br>11 | travel<br>mm<br>12     |
| 700                | 15,6-16,4         | 700                          | 16,0 |                       | 1145-1160<br>1220-1250<br>0 - 1,0 | 250                    | 6,7                   | 250      | min. 7,8<br>6,6-6,8<br>00 = 2,0 | 850<br>100    | 12,0-12,1<br>11,9-12,1 |

Torque-control travel on flyweight assembly dimension a =

mm

1145-1160 min<sup>-1</sup>

1 mm less control rod trave!

### C. Settings for Fuel Injection Pump with Fitted Governor

| Full-load delivery on governor control lever Test oil temp. 40°C (104°F) |   |  | Control rod stop | 33) | 1261         |                                       |  | Starting fuel delivery Idle speed Common |  |  |
|--|---|--|------------------|-----|--------------|---------------------------------------|--|--|--|--|
| rev/min<br>1   | cm <sup>3</sup> /~1000 strokes<br>2     |  | rev/min<br>3     |     | rev/min<br>4 | cm³/-1000 strokes<br>5                |  | rev/ınin<br>6                            | cm <sup>3</sup> /1000 strokes:/ mm<br>7              |  |
| LDA<br>850   | 0,7 bar<br>136,5-139,5<br>(134,0-142,0) |  | -                |     | LDA<br>600   | 0 bar<br>127,5-130,5<br>(125,0-133,0) |  | 100                                      | 245,0-285,0<br>(241,0-289,0)<br>= 19,5-21,0<br>mm RW |  |

Checking values in brackets

DAF 11,6 i 8

Test at n =

600

rev/min decreasing pressure – in bar gauge pressure increasing

|                 | Pump/governor                       | Setting              | Measurement          | diminution Control rod travel- difference                |
|-----------------|-------------------------------------|----------------------|----------------------|--|
| 3               |                                     | Gauge pressure = bar | Gauge pressure = bar | mm (1)   |
| Testoil-ISO 411 | PE 6 PRS372-1<br>+PA17-1<br>/PA 417 | 0,70                 | 0<br>0,30<br>0,26    | 12,0 - 12,1<br>11,4 - 11,5<br>11,8 - 11,9<br>11,5 - 11,7 |

Notes:

(1) when n =

rev/min and gauge pressure =

estoil-ISO 4113

# **Test Specifications** Fuel Injection Pumps ② and Governors

WPP 001/4 DAF 11.6 k 5 1. Edition

PE6P120A 320 RS 372-1

Komb-Nr. 0 401 846 503

RO 250/1000 PA 417-3

supersedes

DAF company

engine

DKSB

215 kW

Values only apply to test nozzle-and-holder assembly 1 688 901 019 and fuel-injection test

tubing 1 680 750 067

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

# A. Fuel Injection Pump Settings

mm (from BDC)

| Rotational speed rev/min | Control rod<br>travel<br>mm<br>2 | Fuel delivery<br>cm <sup>3</sup> /100 strokes<br>3 | Difference<br>cm³/<br>100 strokes<br>4 | Control rod<br>travel<br>mm<br>2 | Fuel delivery<br>cm <sup>3</sup> /100 strokes<br>3 | Spring pre-tensioning<br>(torque-control valve)<br>mm<br>6 |
|--------------------------|----------------------------------|--|--|----------------------------------|--|--|
| 850                      | 11,2+0,                          | 1 17,9-18,1  | 0,5(0,9)                               |                                  |  |  |
| 250                      | 6,6-6,8                          | 1,4-2,0  | 0,8(1,2)                               |                                  |  |  |
|                          |                                  |  |  |                                  |  |  |
|                          |                                  |  |  |                                  |  |  |

Adjust the fuel delivery from each outlet according to the values in

### **B. Governor Settings**

| Checkin | g of slider                 | Full-load s |                             | -                                | cifications (4)                 | Idle spec    | _                                |              | cifications (5)              | Torque d      | (3)                    |
|---------|-----------------------------|-------------|-----------------------------|----------------------------------|---------------------------------|--------------|----------------------------------|--------------|------------------------------|---------------|------------------------|
| rev/min | Control rod<br>travel<br>mm | rev/min     | Control<br>red travel<br>mm | Central<br>red travel<br>mm<br>5 | rev/min                         | rev/min<br>7 | Cantral<br>red travel<br>mm<br>8 | rev/min<br>9 | travel<br>mm                 | rev/min<br>11 | travel                 |
| 700     | 15,6-16,4                   | 700         | 16,0                        |                                  | 1035-1050<br>1095-1125<br>0-1,0 | 4            | 6,3                              | 250          | min.7,4<br>6,2-6,4<br>85=2,0 | 850<br>1000   | 11,4-11,5<br>11,3-11,5 |
| Torque  | control travel              |             | 0                           |                                  |                                 |              |                                  | 1035-        | 050 min <sup>-1</sup>        |               | f mm less control      |

Torque-control travel on flyweight assembly dimension a =

Speed regulation At

t mm less control rod travel

### C. Settings for Fuel Injection Pump with Fitted Governor

| governor   | felivery on control lever mp 40°C (104°F) | Control rod stop 3a | Fuel deliv | ery characteristics 3b                | Starting f   | uel delivery<br>d                                     |
|------------|---|---------------------|------------|---------------------------------------|--------------|---|
| rev/min    | cm³/-1000 strokes                         | rev/min             | rev/min    | cm <sup>3</sup> /-1000 strokes        | rev/min<br>6 | red travel<br>cm <sup>3</sup> /1000 strokes / mm<br>7 |
| LDA<br>850 | 0,7 bar<br>179,0-181,0<br>(176,0-184,0)   | -                   | LDA<br>600 | 0 bar<br>135,5-137,5<br>(132,5-140,5) | 100          | 305,0-345,0<br>(301,0-349,0)                          |
|            |   |                     |            |                                       | 250          | 6,2-6,4 mm RW   |
|            |   |                     |            |                                       |              |   |

Checking values in brackets

DAF 11,6k5 -2-

| Test at n = | rev/min decreasing pressure - in bar gauge pressure |
|-------------|---|
|-------------|---|

| 600<br>Pump/governor        | Setting              | Measurement          | diminution<br>Control rod travel-<br>difference  |
|-----------------------------|----------------------|----------------------|--|
|                             | Gauge pressure = bar | Gauge pressure = bar | mm (1) .   |
| PE6PRS 372-1<br>+RQPA 417-3 | 0,70                 | 0<br>0,33<br>0,27    | 11,2-11,3<br>10,0-10,1<br>10,9-11,0<br>10,2-10,4 |
|                             |                      | •                    |  |

Notes

(1) when n

rev/min and gauge pressure =

# Test Specifications Fuel Injection Pumps (A) and Governors

40

WPP 001/4 DAF 11,6k3
3. Edition

Er

PE 6 P 110 A 320 RS 372-1 Komb.-Nr. O 401 876 254 RSV 250-1100 P5/458 R P5/458-1 supersedes 7.83 company DAF

DKTD 1160 engine 191 kW (260 PS)

Note VDT-I-420/114

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

### A. Fuel Injection Pump Settings

Port closing at prestroke

7.7

2,8-2,9 (2,75-2,95)

mm (from BDC)

| Rotational speed rev/min 1 | Control rod travel | Fuel delivery<br>cm <sup>-/</sup> 100 strokes<br>3 | Difference<br>cm <sup>-/</sup><br>100 strokes<br>4 | Control rod<br>travet<br>mm<br>2 | Fuel delivery<br>cm <sup>-/100</sup> strokes<br>3 | Spring pre-tensioning (torque-control valve) mm |
|----------------------------|--------------------|--|--|----------------------------------|---|---|
| 850                        | 12,0+0,1           | 13,7 - 14,0  | 0,4 (0,75)   |                                  |   |   |
| 250                        | 6,6-6,8            | 0,7 - 1,2  | 0,45(0,75)   |                                  |   |   |
|                            |                    | Į.   |  |                                  |   |   |
|                            |                    |  |  |                                  |   |   |

Adjust the fuel delivery from each outlet according to the values in

### **B. Governor Settings**

| Degree of deflection of control lever | r rated speed<br>Control rod<br>travel<br>mm |                                    | Intermed | drate rated | speed<br>6 | Control-<br>lever<br>deflection<br>in degrees<br>7 | Lower<br>rev/min<br>8 | rated speed<br>Control rod<br>travel<br>mm | 3 To rev/min 10 | rque control<br>Control rod<br>travel<br>mm |
|---------------------------------------|--|------------------------------------|----------|-------------|------------|--|-----------------------|--|-----------------|---|
| loose                                 | 800<br>x =                                   | 0,3-1,0<br>4,25                    | -        | -           | •          | ca. 21   | 250<br>250            | 6,2<br>6,6-6,8                             | 400<br>300      | 12,2 <b>+0,</b> 1 12,4+0,5                  |
| ca. 51                                | 11,0<br>4,0<br>1425                          | 1140-1150<br>1275-130<br>0,3 - 1,5 | 1        |             |            |  | 640-700               | = 2,0                                      |                 |   |

The numbers denote the sequence of the tests

### C. Settings for Fuel Injection Pump with Fitted Governor

|                             | II load stop                              | Rotational- speed limitat   |            | el delivery<br>paracteristics         | idle Side |   |              | e stop<br>  Control rod |  |
|-----------------------------|---|-----------------------------|------------|---------------------------------------|-----------|---|--------------|-------------------------|--|
| Test oil to<br>rev/min<br>1 | emp 40°C (104°F)<br>cm*/1000 strokes<br>2 | Note changed to ) rev/min 3 | rev/min    | cm <sup>3</sup> /1000 strokes<br>5    | rev/min   | cm <sup>y</sup> 1000 strokes<br>7                   | rev/min<br>8 | travel<br>mm<br>9       |  |
| LDA<br>850                  | 0,7 bar<br>137,0-1 40,0<br>134,5-1 42,5)  | 1140-1150*                  | LDA<br>600 | 0 bar<br>127,5-130,5<br>(124,5-133,5) | 100       | 245,0-285<br>241,0-289<br>= 19,5 -<br>21,0 mm<br>RW | 0 250<br>O)  | 6,7                     |  |

Checking values in brackets

\* 1 mm less control rod travel than col 2

5.84

BOSCH

Geschaftsbereich KM. Kundendienst. Klz-Ausrustung. 1980 by Robert Bosch GmbH. Postfach 50, D-7000 Stuttgart 1. Printed in the Federal Republic of Germany Imprimé en République Fédérale d'Allemagne par Robert Bosch GmbH.

DAF 11,6 k 3

Test at n =

600

rev/min decreasing pressure - in bar gauge pressure

| Pump/governor                            | Setting              | Measurement          | diminution<br>Control rod travel-<br>difference          |
|--|----------------------|----------------------|--|
|  | Gauge pressure = bar | Gauge pressure = bar | mm (1) .   |
| PE 6 PRS 372-1<br>+ P5/458<br>/ P5/458-1 | 0,30                 | 0,70<br>0<br>0,26    | 11,8 - 11,9<br>12,0 - 12,1<br>11,4 - 11,5<br>11,5 - 11,7 |

Testoil-ISO 4113

Notes.

(1) when n =

rev/min and gauge pressure =

# Test Specifications Fuel Injection Pumps (A) and Governors

WPP 001/4 DAF 11.6 k 4 2. Edition

PE 6 P 120 A 320 RS 372-1

RSV 250-1100 P5/458 R

11.82 supersedes DAF company

Komb.-Nr. 0 401 876 255

engine

Note VDT-I-420/114

**DKS 1160** 235 kW

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

# A. Fuel Injection Pump Settings 2,8-2,9 Port closing at prestroke (2,75-2,95) mm

mm (from BDC)

| Rotational speed | Control rod | Fuel delivery                | Difference                           | Control rod<br>travel | Fuel delivery        | Spring pre-tensioning (torque-control valve) |
|------------------|-------------|------------------------------|--------------------------------------|-----------------------|----------------------|--|
| rev/min          | mm 2        | cm <sup>-/</sup> 100 strokes | cm <sup>-/</sup><br>100 strokes<br>4 | mm<br>2               | cm*/100 strokes<br>3 | mm<br>6                                      |
| 850              | 10,9+0,1    | 19,3-19,7                    | 0,5 (0,9)                            |                       | ·                    |  |
| 250              | 6,2-6,4     | 1,1-1,5                      | 0,65(0,95                            | )                     |                      |  |
|                  |             |                              |                                      |                       |                      |  |
|                  |             |                              |                                      |                       |                      |  |

Adjust the fuel delivery from each outlet according to the values in [

### **B.** Governor Settings

| Uppe                                  | r rated speed               |  | Intermed | d:ate rated | speed | (4)  | -            | rated speed    | <b>3</b> 10 | rque control<br>  Control rod |
|---------------------------------------|-----------------------------|--|----------|-------------|-------|--|--------------|----------------|-------------|-------------------------------|
| Degree of deflection of control lever | Control rod<br>travel<br>mm | Control rod<br>travel<br>mm rev/min<br>3 | 4        | 5           | 6     | Control-<br>lever<br>deflection<br>in degrees<br>7 | rev/min<br>8 | travel<br>mm   | rev/min     | travel<br>mm                  |
| loose                                 | 800<br>X =                  | 0,3-1,0<br>5,0                           | -        | -           | •     | ca. 24   | 250<br>250   | 5,8<br>6,2-6,4 | 400<br>300  | 11,1+0,1<br>11,3+0,5          |
| ca.54                                 | 9,9<br>4,0<br>1425          | 1140-1150<br>1260-1290<br>0,3-1,7        | K .      |             |       |  | 620-680      | = 2,0          |             |                               |

The numbers denote the sequence of the tests

### C. Settings for Fuel Injection Pump with Fitted Governor

| (4) | il load stop<br>emp 40°C (104 F)       | Rotational-<br>speed limitat | 11.349       | iel delivery<br>paracteristics<br>1   | Starting f | uel delivery 5                                       | 42) Idi      | e stop<br>Control rod |
|-----|--|------------------------------|--------------|---------------------------------------|------------|--|--------------|-----------------------|
|     | cm <sup>1</sup> /1000 strokes          | changed to ) rev/min 3       | revimin<br>4 | cm <sup>1/1000</sup> strokes<br>5     | rev/min    | cm /1000 strokes<br>7                                | rev/min<br>8 | travel<br>mm<br>9     |
| 850 | 0,7 bar<br>193,0-197,0<br>190,0-200,0) | 1140-1150*                   | LDA<br>600   | 0 bar<br>133,5-137,5<br>(130,0-141,0) | 100        | 320,0-360,<br>316,0-364<br>= 19,5 -<br>21,0 mm<br>RW | 0 250<br>,o) | 6,3                   |

Checking values in brackets

\* 1 mm less control rod travel than col 2

5.84

Geschaftsbereich KH. Kundendienst: Kfz-Ausrustung. 1980 by Robert Bosch GmbH. Postfach 50: 0-7000 Stuttgart 1: Printed in the Federal Republic of Germany Imprime en Republique Fédérale d Allemagne par Robert Bosch GmbH.

DAF 11,6 k 4 - 2

Test at n =

600

rev/min decreasing pressure – in bar gauge pressure

| Pump/governor | Setting              | Measurement          | diminution<br>Control rod travet-<br>difference |
|---------------|----------------------|----------------------|---|
|               | Gauge pressure = bar | Gauge pressure = bar | mm (1)  |
| PE6PRS372-1   | 0,36                 |                      | 10,6 - 10,7                                     |
| +P5/458R      |                      | 0,70                 | 10,9 - 11,0                                     |
|               |                      | 0                    | 9,8 - 9,9                                       |
|               |                      | 0,28                 | 10,0 - 10,4                                     |
|               |                      |                      |   |
|               |                      |                      |   |
|               |                      |                      |   |
|               |                      | <u> </u>             |   |

Notes

(1) when n

rev/min and gauge pressure =

## **Test Specifications** Fuel Injection Pumps (A) and Governors

WPP 001/4 DAF 11,6 k 2 4. Edition

PE 6 P 120 A 320 RS 372-1 Y

RSV 250-1100 P5/458 R

supersedes 2.84 DAF company

Note VDT-I-420/114

Port closing at prestroke

Values only apply to test nozzle-and-holder assembly 1 688 901 019 and fuel-injection test tubing 1 680 750 067
All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers **DKX 1160** 243 kW

Komb.-Nr. 0 401 876 261

A. Fuel Injection Pump Settings

2,8-2,9 (2.75-2.95)

mm (from BDC)

| Rotational<br>speed<br>rev/min | Control rod travel | Fuel delivery  cm*/100 strokes 3 | Difference<br>cm <sup>-/</sup><br>100 strokes<br>4 | Control rod<br>travel<br>mm<br>2 | Fuel delivery<br>cm 4100 strokes<br>3 | Spring pre-tensioning<br>(torque-control valve)<br>mm |
|--------------------------------|--------------------|----------------------------------|--|----------------------------------|---------------------------------------|---|
| 850                            | 11,4+0,1           | 18,3-18,6                        | 0,5 (0,9)  |                                  |                                       |   |
| 250                            | 6,4-6,6            | 1,1-1,5                          | 0,8 (1,2)  |                                  |                                       |   |

Adjust the fuel delivery from each outlet according to the values in

### **B.** Governor Settings

|                                       |  |                                     | Inton    | diate saled | cood |  | Lower  | rated speed                 | (A) Io | rque control                |
|---------------------------------------|--|-------------------------------------|----------|-------------|------|--|--------|-----------------------------|--------|-----------------------------|
| Degree of deflection of control lever | rated speed<br>Control rod<br>travel<br>mm | Control rod<br>travet<br>mm rev/min | intermed | diate rated | 6    | Control-<br>lever<br>dellection<br>in degrees<br>7 |        | Control rod<br>travel<br>mm | 1(3)   | Control rod<br>travel<br>mm |
| loose                                 | 800  | 0,3-1,0                             | -        | -           | -    | ca. 24   | 250    | 6,0                         | 400    | 11,6-11,7                   |
| 10036                                 | x =  | 5,0                                 |          |             |      |  | 250    | 6,4-6,6                     | 300    | 11,8-12,3                   |
| ca. 54                                | 10,4<br>4,0<br>1425                        | 1140-1150<br>1270-1300<br>0,3-1,7   |          |             |      |  | 670-73 | ) = 2,0                     |        |                             |

The numbers denote the sequence of the tests

### C. Settings for Fuel Injection Pump with Fitted Governor

| (J)         | ill-load stop                             | Rotational-<br>speed limitat |            | iel delivery<br>naracteristics        | Starting I | fuel delivery 5   | 4a) Idle stop |                                  |  |
|-------------|---|------------------------------|------------|---------------------------------------|------------|---|---------------|----------------------------------|--|
| rest oil to | emp 40°C (104°F)<br>cm*/1000 strokes<br>2 | Note changed to ) rey/min 3  | rev/min    | cm <sup>3</sup> /1000 strokes<br>5    | rev/min    | cm <sup>1/1000</sup> strokes<br>7                             |               | Control rod<br>travel<br>mm<br>9 |  |
| LDA<br>850  | 0,7 bar<br>183,0-186,0<br>(180,0-189,0)   | 1140-1150*                   | LDA<br>600 | 0 bar<br>135,0-138,0<br>(132,0-141,0) | 100        | 315,0-<br>355,0<br>(311,0-<br>359,0)<br>= 19,5-<br>21,0 mm Rk | 250           | 6,5                              |  |

Checking values in brackets

\* 1 mm less control rod travel than col 2

5.84

Geschaftsbereich KH. Kundendienst. Kfz-Ausrustung. 1980 by Robert Bosch GmbH. Postfach 50. D-7000 Sluttgart 1. Printed in the Federal Republic of Germany Imprimé en République Fédérale d'Altemagne par Robert Bosch GmbH.

DAF 11,6 k 2

Testain -

600

rev/min decreasing pressure - in bar gauge pressure

| Pump/governor                | Setting              | Measurement          | diminution Control rod travet- difference        |
|------------------------------|----------------------|----------------------|--|
|                              | Gauge pressure = bar | Gauge pressure = bar | mm (1) .   |
| PE 6 PRS 372-1y<br>+P5/458 R | 0,37                 | 0,70<br>0<br>0,30    | 11,0-11,1<br>11,4-11,5<br>10,0-10,1<br>10,3-10,7 |
|                              |                      |                      |  |

Notes

(1) when n

rev/min and gauge pressure =

# Test Specifications Fuel Injection Pumps ① and Governors

WPP 001/4 MAN 11,1 q 1 4. Edition

En

PES 6 P 110 A 720 LS 375

ROV 250-1100 PA 373 DR

Komb.-Nr. 0 402 046 180

supersedes 10.83

company MAN

engine. D 2566 MTF

206 kW (280 PS)

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

### A. Fuel Injection Pump Settings

| Rotational speed | Control rod | (2,95-3,15)<br>Fuel delivery | Difference                       | Control rod | Fuel delivery                | Spring pre-tensioning  |
|------------------|-------------|------------------------------|----------------------------------|-------------|------------------------------|------------------------|
| rev/min          | travel      | cm <sup>3</sup> /100 strokes | cm <sup>3</sup> /<br>100 strokes | travel      | cm <sup>3</sup> /100 strokes | (torque-control valve) |
| 1                | 2           | 3                            | 4                                | 2           | 3                            | 6                      |
| 1100             | 12,4+0,1    | 14,6-14,9                    | 0,4(0,75)                        |             |                              |                        |
| 250              | 7,3-7,5     | 1,0-1,5                      | 0,45(0,75                        | )           |                              |                        |
|                  |             |                              |                                  | ]           |                              |                        |
|                  |             |                              |                                  |             |                              |                        |
|                  |             |                              |                                  |             |                              |                        |

Adjust the fuel delivery from each outlet according to the values in

### **B.** Governor Settings

| Upper rated s | peed               |                   | Intermediate         | rated sp | eed                   | Lower rated          | speed       |                       | Sliding s   | leeve travel       |
|---------------|--------------------|-------------------|----------------------|----------|-----------------------|----------------------|-------------|-----------------------|-------------|--------------------|
|               | rev/min<br>Control | Control rod (see  | Degree of deflection |          | Control rod<br>travel | Degree of deflection | ŀ           | Control rod<br>travel |             | ①                  |
| of control    | rod travel         | mm<br>rev/min (28 | of control<br>lever  | rev/min  | mm (4)                | of control<br>lever  | rev/min     | mm ③                  | rev/min     | mm                 |
| 1             | 2                  | 3                 | 4                    | 5        | 6                     | 7                    | 8           | 9                     | 10          | 11                 |
| max.          | 1140               | 15,2-17,8         | -                    | -        | -                     | ca. 13               | 100         | min.8,9               | 325         | 1,7-2,2            |
|               |                    |                   |                      |          |                       |                      | 250<br>520- | 7,3-7,5<br>580=2,0    | 900<br>1100 | 6,2-6,4<br>8,0-8,2 |
| ca.65         | 11,4               | 1140-1150         |                      | l        |                       |                      | 320-        | 500=2,0               | 100         | 0,0-0,2            |
|               | 4,0                | 1225-125          | <b>'</b>             |          |                       | 390-510              |             |                       |             |                    |
|               |                    | _                 |                      |          |                       | 30                   |             |                       |             |                    |

Torque control travel a = 0,9 mm

### C. Settings for Fuel Injection Pump with Fitted Governor

| Full-load d<br>Control-roi<br>Test oil ten |  | limitation<br>intermediate speed | high idle s | ery characteristics (5a) Starting fuel delivery lidle switching point |         | Torque-<br>travel             | Control rod |                    |
|--|--|----------------------------------|-------------|---|---------|-------------------------------|-------------|--------------------|
| rev/min                                    | cm³/1000 strokes                       | rev/min 40                       | rev/min     | cm <sup>3</sup> /1000 strokes   | rev/min | cm <sup>3</sup> /1000 strokes | rev/min     | mm                 |
| 1  | 2                                      | 3                                | 4           | 5   | 6       | 7                             | 8           | 9                  |
| LDA<br>1100                                | 0,7 bar<br>146,0-149,0<br>(143,5-151,5 |                                  | LDA<br>500  | 0,2 bar<br>123,0-127,0<br>(120,0-130,0                                | }       | (221,0-249,0                  | 700<br>900  | 13,3+0,<br>13,0+0, |
| LDA  | 0,7 bar<br>157,0-161,0<br>(154,0-164,0 |                                  | LDA<br>500  | 0 bar<br>110,0-113,0<br>(107,5-115,5                                  |         | 10,0-15,0<br>(7,5-17,5)       | 1000        | 12,5+0,            |

Checking values in brackets

\* 1 mm less control rod travel than col. 2

MAN 11,1 q 1 - 2 -

500 rev/min decreasing pressure - in bar gauge pressure

| 333                             |                      |                      |  |
|---------------------------------|----------------------|----------------------|--|
| Pump/governor                   | Setting              | Measurement          | diminution Control rod travel- difference        |
|                                 | Gauge pressure = bar | Gauge pressure = bar | mm (1)   |
| PES 6 PLS 375<br>+ RUVPA 373 DR | 0,70                 | 0<br>0,20<br>0,32    | 13,3-13,4<br>11,3-11,4<br>11,8-11,9<br>12,6-12,8 |
|                                 |                      | 1                    |  |

Notes

(1) when n

rev/min and gauge pressure =

Testcil-150

# Test Specifications Fuel Injection Pumps ② and Governors

40

WPP 001/4 MAN 11,1 q 19 2. Edition

En

PES 6 P 110 A 720 LS 375

RO 250/1100PA 658

supersedes 10.83

Komb.-Nr. 0 402 046 251 0 402 046 253 0 402 046 297 engine: D 2566 MT (F) 206 kW (280 PS)

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke

(2.95-3.15)

mm (from BDC) Zy1.6; RW = 9,0-12,0 mm

| Rotational speed rev/min |          | Fuel delivery  cm <sup>3</sup> /100 strokes 3 |           | Control rod<br>travel<br>mm | Fuel delivery  cm <sup>3</sup> /100 strokes 3 | Spring pre-tensioning<br>(torque-control valve)<br>mm<br>6 |
|--------------------------|----------|---|-----------|-----------------------------|---|--|
| 1100                     | 12,4+0,1 | 14,6-14,9                                     | 0,4(0,75) |                             |   |  |
| 250                      | 7,3-7,5  | 1,1-1,6                                       | 0,45(0,79 | <b>;</b> )                  |   |  |
|                          |          |   |           |                             |   |  |
|                          |          |   |           |                             |   |  |

Adjust the fuel delivery from each outlet according to the values in

**B. Governor Settings** 

| hecking of slider RG check Control rod travel ev/min mm | 1 1   | nt To<br>Control Co<br>red travel re | est speci<br>entreli<br>el travel |                                 | Idle spee<br>Setting p<br>rev/min<br>7 | Control<br>red travel | Test spe            | cifications Control rod travel | rev/min    | Control rod (3)                                  |
|---|-------|--------------------------------------|-----------------------------------|---------------------------------|--|-----------------------|---------------------|--------------------------------|------------|--|
| 600 19,2-20,8<br>VH = max. 46°                          | 600 2 |                                      | 1,<br>4,0<br>350                  | 1145-1160<br>1900-1220<br>0-1,0 |  | 7,4                   | 100<br>250<br>355-3 | min.8,9<br>7,3-7,5<br>95 = 2,0 | 700<br>880 | 12,4-12,5<br>13,3-13,4<br>13,1-13,3<br>12,6-12,9 |

Torque-control travel on flyweight assembly dimension a =

0,3

Speed regulation: At

t mm less control rod travel

### C. Settings for Fuel Injection Pump with Fitted Governor

| Full-load de<br>governor c<br>Test oil ten |  | Control rod stop 3a | Fuel deliv               | ery characteristics (3b)   | Starting for Idle spee | Control   |
|--|--|---------------------|--------------------------|--|------------------------|---|
| rev/min<br>1 .                             | cm <sup>3</sup> /-1000 strokes   | rev/min<br>3        | rev/min                  | cm <sup>3</sup> /-1000 strokes<br>5  | rev/min<br>6           | red travel<br>cm <sup>3</sup> /1000 strokes:/ mm<br>7 |
| LDA<br>1100<br>LDA<br>700                  | 0,7 bar<br>146,0-149,0<br>(143,5-151,5)<br>0,7 bar<br>157,0-161,0<br>(154,0-164,0) | -                   | LDA<br>500<br>LDA<br>500 | 0,2 bar<br>123,0-127,0<br>(120,0-130,0)<br>0 bar<br>110,0-113,0<br>(107,5-115,5) | 100                    | 215,0-225,0<br>211,0-229,0)                           |

Checking values in brackets

5.84

**BOSCH** 

MAN 11,1 q 19

Testatin =

500

rev/min decreasing pressure - in bar gauge pressure

| Pump/governor | Setting              | Measurement          | diminution Control rod travet difference |
|---------------|----------------------|----------------------|--|
|               | Gauge pressure = bar | Gauge pressure = bar | mm (1) .                                 |
| PES6PLS375    | 0,70                 |                      | 13,3 - 13,4                              |
| + RQPA658     |                      | 0                    | 11,3 - 11,4                              |
|               |                      | 0,20                 | 11,8 - 11,9                              |
|               |                      | 0,32                 | 12,4 - 12,8                              |
|               |                      |                      |  |
|               |                      |                      |  |
|               |                      |                      | ·  |
|               |                      |                      |  |

Notes

(1) when n

rev/min and gauge pressure =

# Test Specifications Fuel Injection Pumps ② and Governors

40

WPP 001/4 MAN 11,1 q 23

2. Edition

\_\_\_!

PES 6 P 110 A 720 LS 375 Komb.-Nr. 0 402 046 258

RQ 250/1100 PA 658-4

supersedes 10.83

engine: 191 kW/2200 min

MAN-Nr. 2-7384

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

### A. Fuel Injection Pump\_Settings

Port closing at prestroke

(2.95-3.15)

mm (from BDCZyl. 6

| Rotational speed rev/min | travel   | Fuel delivery<br>cm <sup>3</sup> /100 strokes<br>3 | Difference<br>cm³/<br>100 strokes | Control rod<br>travel<br>mm<br>2 | Fuel delivery<br>cm <sup>3</sup> /100 strokes<br>3 | Spring pre-tensioning<br>(torque-control valve)<br>mm |
|--------------------------|----------|--|-----------------------------------|----------------------------------|--|---|
| 1100                     | 11,7+0,1 | 13,6-13,8  | 0,4(0,8)                          |                                  |  |   |
| 250                      | 6,8-7,0  | 1,1-1,7  | 0,4(0,7)                          |                                  |  |   |
|                          |          |  |                                   |                                  |  |   |
|                          |          |  |                                   |                                  | 1  |   |

Adjust the fuel delivery from each outlet according to the values in

### **B. Governor Settings**

| Checking    | g of slider           | Full-load s  | speed re              | gulation              |                                 | Idle spec    | ed regula          | ilion |                                    | Torque o |                        |
|-------------|-----------------------|--------------|-----------------------|-----------------------|---------------------------------|--------------|--------------------|-------|------------------------------------|----------|------------------------|
|             | Control rod           | Setting po   | Control<br>rad travel | Control<br>rad travel | cifications (4)                 | ,            | Control red travel |       | cifications (5) Control rod travel | rev/min  | Control rod            |
| rev/min     | 5<br>mm               | rev/min<br>3 | тт<br>4               | mm<br>5               | rev/min<br>6                    | rev/min<br>7 | mm<br>8            | 9     | 10                                 | 11       | 12                     |
| 600<br>VH = | 19,2-20,8<br>max. 46° | 600          | 20,0                  | 10,7<br>4,0<br>1350   | 1145-1160<br>1200-1230<br>0-1,0 |              | 7,0                |       | min. 8,5<br>6,9 - 7,1<br>10 = 2,0  |          | 11,7-11,8<br>11,7-11,9 |
|             |                       | L            | <u> </u>              |                       | L                               | L            |                    | 4.05  | 160 min=1                          | ·        | L                      |

Torque-control travel on flyweight assembly dimension a =

mm

Speed regulation At

1 mm less control

### C. Settings for Fuel Injection Pump with Fitted Governor

| Full load de<br>governor of<br>Test oil ten | elivery on<br>control lever<br>np 40°C (104°F)                                    | Control rod stop 3a | Fuel deliv               | ery characteristics 3b  | Starting f   | uel delivery                       |
|---|---|---------------------|--------------------------|---|--------------|------------------------------------|
| revimin                                     | cm <sup>3</sup> /-1000 strokes<br>  2   | rev/min             | rev/min                  | cm <sup>3</sup> /-1000 strokes  | rev/min<br>6 | cm <sup>3</sup> /1000 strokes / mm |
| LDA<br>1100<br>LDA<br>700                   | 0,7 bar<br>136,0-138,0<br>(133,0-141,0)<br>0,7 bar<br>133,0-137,0<br>(130,0-140,0 | -                   | LDA<br>500<br>LDA<br>500 | 0,17 bar<br>123,0-127,0<br>(120,0-130,0)<br>0 bar<br>113,0-116,0<br>(110,0-119,0) | 100          | 215,0-235,0                        |
|   |   |                     |                          |   |              | ,                                  |

Checking values in brackets

MAN 11,1 q 23

- 2 -

| Gauge pressure bar Gauge pressure bar mm (1)  PES6PLS375 + RQPA658-4  0,17  11,5 - 11,7 - | <del></del> . |
|---|---------------|
| + ROPA658-4 0,17 11,5 -   |               |
| + R0PA658-4   | 44.6          |
| 0.70  |               |
|   | 11,8          |
| 0 11,0 -  | 11,1          |
| 0,11 11,2 -   | 11,4          |
|   |               |

Notes (1) when n

rev/min and gauge pressure

# Test Specifications Fuel Injection Pumps ① and Governors

WPP 001/4 MAN 11,1r5

1. Edition

En

PES6P110A720LS375

RQV 250-1100 PA 669

supersedes

Komb.-Nr. 0 402 046 272

company: MAN

0 402 046 273

engine D 2566 MTF

206 kW

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

### A. Fuel Injection Pump Settings

| Rotational speed | Control rod<br>travel<br>mm<br>2 | Fuel delivery<br>cm <sup>3</sup> /100 strokes<br>3 | Difference<br>cm³/<br>100 strokes<br>4 | Control rod<br>travel<br>mm<br>2 | Fuel delivery<br>cm <sup>3</sup> /100 strokes<br>3 | Spring pre-tensioning<br>(torque-control valve)<br>mm<br>6 |
|------------------|----------------------------------|--|--|----------------------------------|--|--|
| 1100             | 12,4+0,1                         | 14,6-14,9  | 0,4(0,75                               |                                  |  |  |
| 250              | 7,3-7,5                          | 1,0-1,5  | 0,45(0,7                               | 5)                               |  |  |
|                  |                                  |  |  | :                                |  |  |

Adjust the fuel delivery from each outlet according to the values in

### **B.** Governor Settings

| Upper rated s         | peed                                   |  | _           | Intermediate                          | rated spi | eed                           | Lower rated                           | speed        | 1                             | Sliding s     | leeve travel |
|-----------------------|--|--|-------------|---------------------------------------|-----------|-------------------------------|---------------------------------------|--------------|-------------------------------|---------------|--------------|
| deflection of control | rev/min<br>Control<br>rod travel<br>mm | Control rod<br>travel<br>mm<br>rev/min | (a)<br>(26) | Degree of deflection of control lever | rev/min   | Control rod<br>travel<br>mm 4 | Degree of deflection of control lever | rev/min<br>8 | Control rod<br>travel<br>mm 3 | rev/min<br>10 | mm<br>11     |
|                       |  |  |             | ~                                     |           |                               | 1.                                    | 100          | -:- 0 0                       | 300           | 2,0-2,       |
| max.                  | 1130                                   | 15,2-1                                 | 7,8         | -                                     | -         | -                             | ca.15                                 | 100<br>250   | min.8,9<br>7,3-7,5            | 850           | 5,9-6,1      |
| са. 66                | 11,4                                   |  |             | •                                     |           |                               |                                       | 250          | 7,5 7,5                       |               |              |
|                       | 4,0                                    |  |             | 1                                     |           | 1                             | 105 10                                | Į.           |                               | 1000          | 8,2          |
|                       | 1350                                   | 0-1,0                                  |             | ļ                                     |           |                               | 365-48                                | ľ            |                               | <b>!</b>      |              |
|                       |  |  |             |                                       |           |                               | <b>3</b> a)                           |              |                               | ļ             |              |

Torque control travel a = 0,9 mm

### C. Settings for Fuel Injection Pump with Fitted Governor

| Full-load d<br>Control-ro<br>Test oil ter |  | Rotational-speed (20) limitation intermediate speed | Fuel deliv        | very characteristics (5a)                        | Starting<br>Idle<br>switchin |  | Torque-<br>travel | Control (5)  Control root travel |
|---|--|---|-------------------|--|------------------------------|--|-------------------|----------------------------------|
| rev/mm                                    | cm³/1000 strokes                                   | rev/min 49  | rev/min           | cm <sup>3</sup> /1000 strokes                    | rev/min                      | cm <sup>3</sup> /1000 strokes                | rev/min           |                                  |
| 1   | 2  | 3   | 4                 | 5  | 6                            | 7  | 8                 | 9                                |
| LDA<br>1100<br>LDA                        | 0,7 bar<br>146,0-149,0<br>(143,5-151,5)<br>0,7 bar | 1140-1150*  | LDA<br>500<br>LDA | 0,2 bar<br>123,0-127,0<br>(120,0-130,0)<br>0 bar |                              | 225,0-245,0<br>(221,0-249,0)<br>7,3-7,5 mmRW | 700<br>900        | 13,3+0,<br>13,0+0,               |
| 700                                       | 157,0-161,0<br>(154,0-164,0)                       |   | 500               | 110,0-113,0<br>(107,5-115,5)                     |                              |  | 1000              | 12,540,                          |

Checking values in brackets

\* 1 mm less control rod travel than col 2

MAN 11,1 r 5

Test at n -

500

rev/min decreasing pressure - in bar gauge pressure

| Pump/governor            | Setting             | Measurement          | diminution Control rod travel- difference        |
|--------------------------|---------------------|----------------------|--|
|                          | Gauge pressure - ba | Gauge pressure = bar | mm (1) .   |
| PES6PLS375<br>+RQVPA 669 | 0,70                | 0<br>0,20<br>0,32    | 13,3-13,4<br>11,3-11,4<br>11,8-11,9<br>12,6-12,8 |

Notes

(1) when n

rev/min and gauge pressure =

bar ( \* maximum full-load control rod travel)

# Test Specifications Fuel Injection Pumps ① and Governors

WPP 001/4 MAN 11,1 r 4

2. Edition

En

PE 6 P 110 A 320 RS 375

RQV 250-1100 PA 674

komb.-Nr. 0 402 046 282

company MAN
engine U 2566 MTE
184 kW

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

### A. Fuel Injection Pump Settings

| Rotational speed | Control rod<br>travel | Fuel delivery                     | Difference<br>cm <sup>3</sup> / | Control rod<br>travel | Fuel delivery                     | Sprima are-tensioning (torque control valve) |
|------------------|-----------------------|-----------------------------------|---------------------------------|-----------------------|-----------------------------------|--|
| rev/min<br>1     | mm<br>2               | cm <sup>3</sup> /100 strokes<br>3 | 100 strokes                     | mm<br>2               | cm <sup>3</sup> /100 strokes<br>3 | mm<br>6                                      |
| 800              | 12,8+0,1              | 15,9-16,2                         | 0,4(0,75)                       |                       |                                   |  |
| 250              | 6,9-7,1               | 1,1-1,6                           | 0,45(0,7                        | 7                     |                                   |  |
|                  |                       |                                   |                                 |                       |                                   |  |
|                  |                       |                                   |                                 |                       |                                   |  |

Adjust the fuel delivery from each outlet according to the values in

### **B.** Governor Settings

| deflection    | rev/min<br>Control<br>rod travel<br>mm | Control rod travel mm rev/min 29               | Intermediate Degree of deffection of control lever 4 | rated sp<br>rev/min<br>5 | Control rod<br>travel<br>mm 4 | Lower rated Degree of deflection of control lever 7 | speed<br>rev/min<br>8 | Control rod<br>travel<br>mm 3 | Sliding s<br>rev/min<br>10 | mm                        |
|---------------|--|--|--|--------------------------|-------------------------------|---|-----------------------|-------------------------------|----------------------------|---------------------------|
| max.<br>ca.46 | 1150<br>10,5<br>4,0<br>1350            | 15,2-17,8<br>1140-1150<br>1205-1235<br>0 - 1,0 |  | -                        | -                             | ca. 13<br>③   | 100<br>250<br>340-    | min.8,5<br>6,9-7,1<br>400=2,0 | 300<br>800<br>1100         | 1,4-1,7<br>5,0-5,2<br>7,9 |

Torque control travel = 1,3 mm

### C. Settings for Fuel injection Pump with Fitted Governor

| Full-load d<br>Control-roi<br>Test oil ten |  | Rotational-speed 2b<br>limitation<br>intermediate speed | Fuel delivingh idle s    | rery characteristics 5e  | Starting<br>Idle<br>switchir |  | Torque-<br>iravel | Control rod                              |
|--|--|---|--------------------------|--|------------------------------|--|-------------------|--|
| rev/min                                    | cm³/1000 strokes   | rev/min 49  | rev/min                  | cm <sup>3</sup> /1000 strokes  | rev/min                      | cm <sup>3</sup> /1000 strokes<br>7                     | rev/min<br>B      |  |
| LDA<br>800<br>LDA<br>1100                  | 0,7 bar<br>159,0-162,0<br>(156,5-164,5<br>0,7 bar<br>136,0-140,0<br>(133,0-143,0 | )   | LDA<br>500<br>LDA<br>500 | 0,17 bar<br>122,0-126,0<br>(119,0-129,0<br>0 bar<br>97,0-100,0<br>(94,5-102,5) |                              | 215,0-235,0<br>(211,0-239,0<br>11,0-16,0<br>(8,5-18,5) | 1100<br>900       | 12,8+0,<br>11,5+0,<br>12,4+0,<br>11,7+0, |

Checking values in brackets

\* 1 mm less control rod travel than col 2

MAN 11,1 r 4

Test at n =

500 rev/min decreasing pressure - in bar gauge pressure

| Pump/governor               | Setting              | Measurement          | diminution Control rod travet- difference        |
|-----------------------------|----------------------|----------------------|--|
|                             | Gauge pressure = bar | Gauge pressure = bar | mm (1) .   |
| PES 6 PLS 375<br>+ RQFA 674 | 0,70                 | 0<br>0,28<br>0,11    | 12,8-12,9<br>10,2-10,3<br>12,1-12,2<br>10,7-11,0 |

Notes

(1) when n =

rev/min and gauge pressure =

bar (= maximum full-load control rod travel)

2

# Test Specifications Fuel Injection Pumps ② and Governors

40

WPP 001/4 DAF11,6 t
5. Edition

En

Testoil-ISO 4113

PE 6 P 100 A 320 RS 384 RQ 225/1000 PA 571

Komb.-Nr. 0 401 846 452
1 - 5 - 3 - 6 - 2 - 4 je 60°+0,5° (+0,75°)

supersedes 11.82
DAF
company: DKDL 1160
engine: 125 kW (170 PS)

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

### A. Fuel injection Pump Settings

Port closing at prestroke

3,20-3,30

mm (from BDC)

| Rotational speed rev/min | Control rod<br>travel<br>mm<br>2 | Fuel delivery<br>cm <sup>3</sup> /100 strokes<br>3 | Difference<br>cm <sup>3</sup> /<br>100 strokes<br>4 | Control rod<br>travel<br>mm<br>2 | Fuel delivery<br>cm <sup>3</sup> /100 strokes<br>3 | Spring pro-tensioning<br>(torque-control valve)<br>mm<br>6 |
|--------------------------|----------------------------------|--|---|----------------------------------|--|--|
| 600                      | 11,4+0,                          | 9,80 - 10,00                                       | 0,35(0,6)   |                                  |  |  |
| 250                      | 7,57,7                           | 0,90 - 1,30  | 0,35(0,55   | )                                |  |  |
|                          |                                  |  |   |                                  |  |  |

Adjust the fuel delivery from each outlet according to the values in

### **B.** Governor Settings

| PRG che | ck<br>Control rod<br>travel |     | int<br>Central<br>rad traval | Test spec<br>Central<br>red travel |           | Idle spec<br>Setting p<br>rev/min<br>7 | Control<br>red travel | Test spe | cifications 5 Control rod travel | rev/min                   | Control rod                                       |
|---------|-----------------------------|-----|------------------------------|------------------------------------|-----------|--|-----------------------|----------|----------------------------------|---------------------------|---|
| 550     | 15,6-16,4                   | 550 | 16,0                         | 9,6<br>4,0<br>1250                 | 1100-1130 | P                                      | 7,6                   | 250      |                                  | 1000<br>600<br>820<br>900 | 10, 6-10,8<br>11,4-11,5<br>11,2-11,4<br>10,8-11,1 |

Torque-control travel on flyweight assembly dimension a

mm

Speed regulation. At

1 mm less control rod travel

### C. Settings for Fuel Injection Pump with Fitted Governor

| Full-load d<br>governor d | control lever (2)              |              |         | ery characteristics                 | Starting f | tuel delivery 6  |
|---------------------------|--------------------------------|--------------|---------|-------------------------------------|------------|--|
| rev/min                   | cm³/-1000 strokes              | rev/min<br>3 | rev/min | cm <sup>3</sup> /-1000 strokes<br>5 | rev/min    | red travel cm <sup>3</sup> /1000 strokes:/ mm<br>7       |
| 600                       | 98,0 - 100,0<br>(96,0 - 102,0) | 600          | 1000    | 93,0 - 97,0<br>(90,5 - 99,5)        | 100        | 170,0 - 210,0<br>(166,0-214,0)<br>= 19,5 - 21,0<br>mm RW |
|                           |                                |              |         |                                     | 250        | 9,0 - 13,0<br>(6,5 - 15,5)                               |

Checking values in brackets

## **Test Specifications** Fuel injection Pumps 2 WPP 001/4 DAF 11,6 t 2 and Governors

3. Edition

PE 6 P 100 A 320 RS 384 Komb.-Nr. 0 401 846 453

RO 225/1100 PA 574

supersedes 11.82 company. DAF

engine-

151 kW (205 PS)

Testoil-ISO 4113

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

### A. Fuel Injection Pump Settings

Port closing at prestroke

(3.15 - 3.35)

mm (from BDC)

| Rotational speed rev/min | Control rod<br>travel<br>mm<br>2 | Fuel delivery<br>cm <sup>3</sup> /100 strokes<br>3 | Difference<br>cm <sup>3</sup> /<br>100 strokes | Control rod<br>travel<br>mm<br>2 | Fuel delivery<br>cm <sup>3</sup> /100 strokes<br>3 | Spring pre-tensioning<br>(torque-control valve)<br>mm<br>6 |
|--------------------------|----------------------------------|--|--|----------------------------------|--|--|
| 600                      | 11,5+0,                          | 11,1-11,3  | 0,35(0,6                                       |                                  |  |  |
| 225                      | 7,2-7,4                          | 1,0 - 1,4  | 0,35(0,5                                       | 5)                               |  |  |
|                          |                                  |  |  |                                  |  |  |
|                          |                                  |  |  |                                  |  |  |

Adjust the fuel delivery from each outlet according to the values in

### **B. Governor Settings**

| Checking of slider PRG check Control rod travel | Fulf-load speed<br>Setting point<br>Central<br>Ind tran | Test spe<br>Central<br>red travel | ı ,          | Idle spec<br>Setting p | Control<br>Control<br>and travel |     | cifications 5<br>Control red<br>travel | Torque (    | Control rod                                      |
|---|---|-----------------------------------|--------------|------------------------|----------------------------------|-----|--|-------------|--|
| rev/min mm                                      | rev/min mm  | mm<br>5                           | rev/min<br>6 | 7                      | 8                                | 9   | 10                                     | 11          | 12   |
| 550 15,6-16,4                                   | 550 16,   | 9,8<br>4,0<br>1300                | 1170-1200    |                        | 7,3                              | 225 | min. 7,5<br>7,2-7,4<br>365=2,0         | 1050<br>800 | 11,5-11,6<br>10,8-11,0<br>11,2-11,4<br>10,9-11,2 |

Torque-control travel

0,25 mm

Speed regulation: At 1140-1155 min<sup>-1</sup>

1 mm less control

### C. Settings for Fuel Injection Pump with Fitted Governor

| Full-load d<br>governor of<br>Test oil ten | elivery on control fever np. 40°C (104°F) | Control rod stop 3a | Fuel deliv   | ery characteristics 3b              | Starting fuel delivery Idle speed |  |  |
|--|---|---------------------|--------------|-------------------------------------|-----------------------------------|--|--|
| rev/min<br>1                               | cm³/-1000 strokes<br>2                    | rev/min<br>3        | rev/min<br>4 | cm <sup>3</sup> /-1000 strokes<br>5 | rev/min<br>6                      | red travel<br>cm <sup>3</sup> /1000 strokes:/ mm<br>7  |  |
| 600  | 110,5-112,5<br>(108,5-114,5)              | 600                 | 1050         | 107,0-111,0<br>(104,5-113,5)        | 100                               | 195,0-235,0<br>(191,0-239,0)<br>= 19,5 - 21,0<br>mm RW |  |

Checking values in brackets

# Test Specifications Fuel Injection Pumps (A) and Governors

40

WPP 001/4 DAF 11,6 w

1. Edition

Εn

PE 6 P 100 A 320 RS 384-1

RSV 250-1100 P 5/506

upersedes DAF

Komb.-Nr. 0 401 876 284

company DK 1160 V

KOMD.-W. 0 401 870 20

engin

Note VDT-I-420/114

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

### A. Fuel Injection Pump Settings

Port closing at prestroke

3,2-3,3 (3,15-3,35

mm (from BDC)

| Rotational speed | Control rod | Fuel delivery                | Difference                            | Control rod<br>travel | Fuel delivery    | Spring pre-tensioning<br>(torque-control valve) |
|------------------|-------------|------------------------------|---------------------------------------|-----------------------|------------------|---|
| rev/min          | mm 2        | cm <sup>1</sup> /100 strokes | cm <sup>1</sup> /<br>100 strokes<br>4 | mm<br>2               | cm 1/100 strokes | mm<br>6   |
| 600              | 11,5+0,1    | 11,1-11,3                    | 0,35(0,6)                             |                       |                  |   |
| 250              | 7,2-7,4     | 1,2-1,6                      | 0,35(0,55)                            |                       |                  |   |
|                  |             |                              |                                       |                       |                  |   |
|                  |             |                              |                                       |                       |                  |   |

Adjust the fuel delivery from each outlet according to the values in lacksquare

### **B.** Governor Settings

|        | rated speed<br>Control rod<br>travel<br>mm | rev/min<br>Controt rod<br>travet<br>mm rev/min | Intermed | hate rated | speed | Control-<br>lever<br>deflection<br>in degrees<br>7 |                     | rated speed<br>Control rod<br>travel<br>mm | 11 9 /                    | rque control<br>Control rod<br>travel<br>mm. |
|--------|--|--|----------|------------|-------|--|---------------------|--|---------------------------|--|
| loose  | 800<br>x =                                 | 0,3-1,0<br>4,25                                | -        | -          | -     | ca. 21   | 250<br>250<br>570-6 | 6,8<br>7,2-7,4<br>30=2,0                   | 1050<br>600<br>825<br>900 | 11,5-11,6<br>11,2-11,4                       |
| ca. 50 | 9,8<br>4,0<br>1400                         | 1125-1135<br>1225-1255<br>0,3-1,7              |          |            |       |  |                     |  | 900                       | 11,1-11,4                                    |

The numbers denote the sequence of the tests

### C. Settings for Fuel Injection Pump with Fitted Governor

|         | ill-load stop<br>emp_40°C (104°F) | Rotational-<br>speed limital |         | el delivery<br>aractenstics  | Starting for | uel delivery 5                                      | 4             | e stop<br>Control rod<br>travel |
|---------|-----------------------------------|------------------------------|---------|------------------------------|--------------|---|---------------|---------------------------------|
| rev/min | cm/1000 strokes                   | changed to ) rev/min 3       | rev/min | cm/1000 strokes<br>5         | tev/min      | cm/1000 strokes<br>7                                | rev/min<br>8  | mm<br>9                         |
| 600     | 110,5-112,5<br>(108,5-114,5)      | 1125-1135*                   | 1050    | 106,5-111,5<br>(104,0-114,0) | 100          | 195,0-239<br>(191,0-239<br>= 19,5-<br>21,0 mm<br>RW | ,0 25<br>),0) | 7,3                             |

Checking values in brackets

\* 1 mm less control rod travel than col. 2



2

# Test Specifications Fuel Injection Pumps ② and Governors

40

WPP 001/4 DAF 11,6 t 6

1. Edition

En

PE 6 P 100 A 320 RS 384-1

RQ 225/1000 PA 571

Komb.-Nr. 0 401 846 465

supersedes DAF

engine: DKDL 1160

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke

(3.15-3.35)

mm (from BDC)

| Rotational speed rev/min 1 | Control rod<br>travel<br>mm<br>2 | Fuel delivery<br>cm <sup>3</sup> /100 strokes<br>3 | Difference<br>cm³/<br>100 strokes<br>4 | Control rod<br>travel<br>mm<br>2 | Fuel delivery<br>cm <sup>3</sup> /100 strokes<br>3 | Spring pre-tensioning<br>(torque-control valve)<br>mm<br>6 |
|----------------------------|----------------------------------|--|--|----------------------------------|--|--|
| 600                        | 11,4+0,1                         | 9,8-10,0   | 0,35(0,6                               |                                  |  |  |
| 250                        | 7,5-7,7                          | 0,9-1,3  | 0,35(0,5                               | 5)                               |  |  |
|                            |                                  |  |  |                                  |  |  |
|                            |                                  |  |  |                                  |  |  |

Adjust the fuel delivery from each outlet according to the values in

**B.** Governor Settings

| Checkin  | g of slider                      | Full-load s  |                              | -                                | cifications (4)                 | Idle spec    | •                            |                    | cifications (5)               | Torque d      | control 3  |
|----------|----------------------------------|--------------|------------------------------|----------------------------------|---------------------------------|--------------|------------------------------|--------------------|-------------------------------|---------------|--|
| rev/min  | Control rod<br>travel<br>mm<br>2 | rev/min<br>3 | Control<br>red travel<br>rnm | Central<br>rad travel<br>mm<br>5 | rev/min                         | rev/min<br>7 | Control<br>red travel<br>rmm | rev/min<br>9       | Control rod<br>travel<br>mm   | rev/min<br>11 | Control rod (                                    |
| 550      | 15,6-16,4                        | 550          | 16,                          | 9,6<br>4,0<br>1250               | 1045-1069<br>1100-1130<br>0-1,0 |              | 7,6                          | 100<br>250<br>345- | min,8,4<br>7,5-7,7<br>385=2,0 | 1000<br>820   | 11,4-11,5<br>10,6-10,8<br>11,2-11,4<br>10,8-11,1 |
| Targue.c | ontrol travel                    | <u></u>      | 0.5                          | <u> </u>                         | <u> </u>                        | L            | 1                            | 045-1              | 060 min 1                     |               | 1 mm less contro                                 |

on flyweight assembly dimension a =

mm

Speed regulation At

mm less control rod travel

### C. Settings for Fuel Injection Pump with Fitted Governor

| governor | delivery on control lever mp 40°C (104°F) | Control rod stop 3a | Fuel deliv | ery characteristics 3b         | Starting f | ruel delivery  |
|----------|---|---------------------|------------|--------------------------------|------------|--|
| rev/min  | cm <sup>3</sup> /-1000 strokes            | rev/min<br>3        | rev/min    | cm <sup>3</sup> /~1000 strokes | rev/min    | rad travel cm <sup>3</sup> /1000 strokes/mm          |
| 600      | 98,0-100,0<br>(96,0-102,0)                | 600                 | 1000       | 93,0-97,0<br>(90,5-99,5)       | 100        | 180,0-220,0<br>(176,0-224,0)<br>= 19,5-21,0<br>mm RW |

Checking values in brackets

7.84

BOSCH

estcil-150 4113

## **Test Specifications** Fuel Injection Pumps 2 and Governors

WPP 001/4 DAF 11,6 s 3

1. Edition

PE 6 P 100 A 320 RS 384-1

RO 225/1100 PA 574

Komb.-Nr. 0 401 846 466

supersedes DAF company **DKL 1160** 

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

### A. Fuel Injection Pump Settings

Port closing at prestroke

mm (from BDC)

| TOTAL COUNTY OF PACE |                       | 3,15-3,337                                    |  |                             |   |   |
|----------------------|-----------------------|---|--|-----------------------------|---|---|
| Rotational speed     | Control rod<br>travel | Fuel delivery<br>cm <sup>3</sup> /100 strokes | Difference<br>cm <sup>3</sup> /<br>100 strokes | Control rod<br>travel<br>mm | Fuel delivery  cm <sup>3</sup> /100 strokes | Spring pre-tensioning (torque-control valve) mm |
| 500                  | 44 5.0                | 44 4 44 2                                     | 0.35/0.6                                       | -                           | 3   |   |
| 600                  | 11,5+0,1              | 11,1-11,3                                     | 0,35(0,6)                                      |                             | <del> </del>                                |   |
| 225                  | 7,2-7,4               | 1,0-1,4                                       | 0,35(0,5                                       | \$)                         |   |   |
|                      |                       |   |  |                             |   |   |
|                      |                       |   |  |                             |   |   |
|                      |                       |   |  |                             |   |   |

Adjust the fuel delivery from each outlet according to the values in

### **B.** Governor Settings

| PRG che | Control rod                         | Full-load s<br>Setting po<br>rev/min<br>3 |      | -                  | rev/min                         | Idle spec<br>Setting p<br>rev/min<br>7 | coint<br>Control<br>red travel |       | cifications 5<br>Control rod<br>travel<br>mm | Torque of rev/min         | Control rod (3) travel mm                        |
|---------|-------------------------------------|---|------|--------------------|---------------------------------|--|--------------------------------|-------|--|---------------------------|--|
| 550     | 15,6-16,4                           | 550                                       | 16,0 | 9,8<br>4,0<br>1300 | 1140-1155<br>1170-1200<br>0-1,0 | 1                                      | 7 <b>,3</b>                    | 225   | min,7,5<br>7,2-7,4<br>65=2,0                 | 600<br>1050<br>800<br>855 | 11,5-11,6<br>10,8-11,0<br>11,2-11,4<br>10,9-11,2 |
|         | ontrol travel<br>ght assembly dimer | nsion a =                                 | 0,25 | mm                 | Spe                             | ed regula                              | tion: At                       | 1140- | 1155 min <sup>-1</sup>                       |                           | 1 mm less control<br>rod travel                  |

on flyweight assembly dimension a = 0,25

### C. Settings for Fuel Injection Pump with Fitted Governor

| governor | delivery on control lever mp 40°C (104°F) | Control rod stop 3a | Fuel deliv   | ery characteristics (3b)            | Starting f<br>Idle spee | Control   |
|----------|---|---------------------|--------------|-------------------------------------|-------------------------|---|
| rev/min  | cm³/-1000 strokes                         | rev/min<br>3        | rev/min<br>4 | cm <sup>3</sup> /-1000 strokes<br>5 | rev/min<br>6            | red travel<br>cm <sup>3</sup> /1000 strokes / mm<br>7                 |
| 600      | 110,5-112,5<br>(108,5-114,5)              | 600                 | 1050         | 107,0-111,0<br>(104,5-113,5)        | 100                     | 195,0-235,0<br>(191,0-239,0)<br>= 19,5-21,0<br>mm RW<br>7,2-7,4 mm RW |

Checking values in brackets

# Test Specifications Fuel Injection Pumps (A) and Governors

40

WPP 001/4 DAF 11,6 t 1 4. Edition

En

**estoli-150 4113** 

PE 6 P 110 A 320 RS 385 RSV 250-750 P7/479 Komb, -Nr. 0 401 876 250 1 - 5 - 3 - 6 - 2 - 4 0 -60 -120-180-240-300+ 0,5° (+0,75°)

superset 1 5 82

engine DK, DKT, DKS, DKA 1160

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 2,80-2,90

mm (from BDC RW 9,0 - 12,0

| Rotational<br>speed<br>rev/min<br>1 | Control rod travel | Fuel delivery<br>cm <sup>-/</sup> 100 strokes<br>3 | Difference<br>cm <sup>-/</sup><br>100 strokes<br>4 | Control rod<br>travel<br>mm<br>2 | Fuel delivery<br>cm*/100 strokes<br>3 | Spring pre tensioning<br>(torque-control valve)<br>mm |
|-------------------------------------|--------------------|--|--|----------------------------------|---------------------------------------|---|
| 750                                 | 12,6+0,1           | 16,9 - 17,2  | 0,4(0,75)  |                                  |                                       |   |
| 250                                 | 6,8-7,0            | 2,5 - 3,3  | 0,45(0,75  | )                                |                                       |   |

Adjust the fuel delivery from each outlet according to the values in

### **B. Governor Settings**

| Degree of deflection of control lever | r rated speed<br>Control rod<br>travel<br>mm |                                  | Intermed | trate rated | speed | Control-<br>lever<br>deflection<br>in degrees<br>7 |            | rated speed<br>Control rod<br>travel<br>mm | 3 To | rque control<br>  Control rod<br>  travel<br>  mm<br>  11 |
|---------------------------------------|--|----------------------------------|----------|-------------|-------|--|------------|--|------|---|
| loose                                 | 800<br>X =                                   | 0,3-1,0<br>3,75                  | -        | -           | -     | ca.18  | 250<br>250 | 6,9<br>6,8 <b>-</b> 7,0                    | -    | -   |
| ca. 44                                | 790-79<br>810-82<br>950 =0,                  | 95 = 11,6<br>25 = 4,0<br>3 - 1,7 |          |             |       |  | 245-305    | =2,0mm                                     |      |   |

The numbers denote the sequence of the tests

### C. Settings for Fuel Injection Pump with Fitted Governor

| 2       | ill-load stop<br>emp 40°C (104°F) | 6 Rotational-<br>speed limital | 3 Fu         | iel delivery<br>paracteristics | Starting t | uel delivery 5                     | <b>4a</b> ) ldi | e stop<br> Control rod |
|---------|-----------------------------------|--------------------------------|--------------|--------------------------------|------------|------------------------------------|-----------------|------------------------|
| rev/min | cm //1000 strokes<br>2            | changed to )<br>rev/min<br>3   | rev/min<br>4 | cm·//1000 strokes<br>5         | rev/min    | cm <sup>3</sup> /1000 strokes<br>7 | rev/min<br>8    | travel<br>mm<br>9      |
| 750     | 169,0 - 172,0<br>(166,5 - 174,5)  | 790- 795 *                     | -            | -                              | 250        | 25,0-33,0<br>22,5-35,5             | -               | -                      |

Checking values in brackets

\* 1 mm less control rod travel than col 2

## **Test Specifications** Fuel Injection Pumps (1A) and Governors

WPP 001/4 DAF 11,6 t 4

Edition

PE 6 P 110 A 320 RS 385-1 Komb.-Nr. 0 401 876 256

RSV 250-750 P 7/479

company DK, DKT, DKS; DKA

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

### A. Fuel Injection Pump Settings

2,8-2,9
Port closing at prestroke (2,75-2,95)

Testoil-ISO 4113

mm (from BDC)= RW 9.0-12.0 mm

| Rotational speed | Control rod | Fuel delivery  | Difference          | Control rod travel | Fuel delivery  | Spring pre-tensioning (torque-control valve) |
|------------------|-------------|----------------|---------------------|--------------------|----------------|--|
| rev/min          | mm . (2)    | cm/100 strokes | cm·/<br>100 strokes | നന                 | cm/100 strokes | mm   |
| 1                | 2           | 3              | 4                   | 2                  | 3              | 6  |
| 750              | 12,6+0,1    | 17,0-17,3      | 0,4(0,75)           |                    |                | _  |
| 250              | 6,8-7,0     | 2,5-3,3        | 0,45(0,75           | þ                  |                |  |
|                  |             | <u> </u>       |                     |                    |                |  |
|                  |             | 1              |                     |                    |                |  |

Adjust the fuel delivery from each outlet according to the values in  $\Box$ 

### **B.** Governor Settings

| Degree of deflection of control lever | r rated speed<br>Control rod<br>travet<br>mm | rev/min<br>Control rod<br>travet<br>mm rev/min | Intermed | trate rated | speed<br>6 | Control-<br>lever<br>deflection<br>in degrees<br>7 |            | rated speed<br>Control rod<br>travel<br>mm | 3 To | rque control<br> Control rod<br> travel<br> mm<br>  11 |
|---------------------------------------|--|--|----------|-------------|------------|--|------------|--|------|--|
| loose                                 | 800<br>x = 3                                 | 0,3-1,0<br>3,75                                | -        | -           | •          | ca. 18   | 250<br>250 | 6,9<br>6,8-7,0                             | -    | -  |
| ca.44                                 | 11,6<br>4,0<br>950                           | 790-795<br>810-825<br>0,3-1,7                  |          |             |            |  | 245-30     | 5 = 2,0                                    |      |  |

The numbers denote the sequence of the tests

### C. Settings for Fuel Injection Pump with Fitted Governor

|         | ull-foad stop<br>emp 40°C (104°F)  | Rotational-<br>speed limitat | 39 Fu        | el delivery<br>aracteristics       | Starting fi  | uel delivery 5                    | <b>4a</b> Idio | stop<br>Control rod<br>Itravel |
|---------|------------------------------------|------------------------------|--------------|------------------------------------|--------------|-----------------------------------|----------------|--------------------------------|
| rev/min | cm <sup>1</sup> /1000 strokes<br>2 | changed to ) rev/min 3       | rev/min<br>4 | cm <sup>1</sup> /1000 strokes<br>5 | rev/min<br>6 | cm <sup>3/1000</sup> strokes<br>7 | rev/min<br>8   | mm<br>9                        |
| 750     | 170,0-173,0<br>(167,5-175,5)       | 790-795*                     | •            | -                                  | -<br>250     | -<br>25,0-33,<br>(22,5-35,        | -<br>5)        | -                              |

Checking values in brackets

\* 1 mm less control rod travel than col 2

7.84

Geschaftsbereich KH. Kundendienst. Kfz-Ausrustung. c. 1980 by Robert Bosch GmbH. Postfach 50. D-7000 Stuttgart 1. Printed in the Federal Republic of Germany Imprimé en République Fédérale d'Allemagne par Robert Bosch GmbH.

Testoil-ISO 4113

40

WPP 001/4 MAN 11,1 q 28

1. Edition

En

PES 6 P 120 A 720 LS 388 RQ 250/1050 PA 658-8 Komb.-Nr. 0 402 046 266 Values only apply to test nozzle-and-holder assembly 1 688 901 019 and fuel-injection test tubing 1 680 750 067

supersedes -

company MAN

engine: D 2566 MK 279

206 kW

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

### A. Fuel Injection Pump Settings

3,0-3,1
Port closing at prestroke (2,05-3,15) mm (from BDC) v 1 6

| Off Closing at pies      | (                                | 2,95-3,15)   | L,  | y1. U                       |  |  |
|--------------------------|----------------------------------|--|---|-----------------------------|--|--|
| Rotational speed rev/min | Control rod<br>travel<br>mm<br>2 | Fuel delivery<br>cm <sup>3</sup> /100 strokes<br>3 | Difference<br>cm <sup>3</sup> /<br>100 strokes<br>4 | Control rod<br>travel<br>mm | Fuel delivery<br>cm <sup>3</sup> /100 strokes<br>3 | Spring pre-tensioning<br>(torque-control valve)<br>mm<br>6 |
| 750                      | 11,8+0,                          | 18,7-18,9  | 0,5(0,9)  |                             |  |  |
| 250                      | 6,3-6,5                          | 1,1-1,7  | 0,8(1,2)  |                             |  |  |
|                          |                                  |  |   |                             |  |  |
|                          |                                  |  |   |                             |  |  |

Adjust the fuel delivery from each outlet according to the values in

### **B. Governor Settings**

| Checkin<br>PRG che | g of slider<br>ck<br>Control rad | Full-load s<br>Setting po |                       | •                     | cifications (4)                 | Idle spec<br>Setting p | _                     |              | cifications 5                   | Torque o      | Control rod                                      |
|--------------------|----------------------------------|---------------------------|-----------------------|-----------------------|---------------------------------|------------------------|-----------------------|--------------|---------------------------------|---------------|--|
| rev/min            | travel                           | rev/min<br>3              | red travel<br>mm<br>4 | red travel<br>mm<br>5 | rey/min<br>6                    | rev/min<br>7           | red travel<br>mm<br>8 | rev/min<br>9 | travel<br>mm<br>10              | rev/min<br>11 | travel<br>mm<br>12                               |
| 600<br>VH =        | 19,2-20,8<br>max. 46°            | 600                       | 20,0                  |                       | 1095-1110<br>1175-1205<br>0-1,0 |                        | 6,4                   | 250          | min.7,9<br>6,3-6,5<br>380 = 2,0 | 1050<br>870   | 11,8-11,9<br>10,7-10,8<br>11,6-11,8<br>10,9-11,2 |

Torque-control travel on flyweight assembly dimension a =

0,5 mm

Speed regulation At 1095-1110 min-1

1 mm less control rod travel

### C. Settings for Fuel Injection Pump with Fitted Governor

|                           | elivery on<br>ontrol lever<br>np. 40°C (104°F)                                     | Control rod stop 3a | Fuel deliv               | ery characteristics 3b   | Starting (   | del delivery  |
|---------------------------|--|---------------------|--------------------------|--|--------------|---|
| rev/min<br>1              | cm³/-1000 strokes  | rev/min             | rev/min                  | cm³/-1000 strokes<br>5   | rev/min<br>6 | red travel<br>cm <sup>3</sup> /1000 strokes:/ mm<br>7 |
| LDA<br>750<br>LDA<br>1050 | 1,0 bar<br>187,0-189,0<br>(184,0-192,0)<br>1,0 bar<br>167,0-173,0<br>(164,0-176,0) | -                   | LDA<br>650<br>LDA<br>500 | 1,0 bar<br>178,0-184,0<br>(175,0-187,0)<br>0 bar<br>113,0-115,0<br>(110,0-118,0) | 100<br>250   | 205,0-225,0<br>(201,0-229,0)<br>6,3-6,5 mm RW         |

Checking values in brackets

MAN 11,1 q 28

- 2 -

| To | <br>at | • |  |
|----|--------|---|--|

500

rev/min decreasing pressure ~ in bar gauge pressure

| 500                       |                      |                      |   |
|---------------------------|----------------------|----------------------|---|
| Pump/governor             | Setting              | Measurement          | diminution<br>Control rod travel-<br>difference |
|                           | Gauge pressure = bar | Gauge pressure = bar | mm (1)  |
| PES6PLS388<br>+ RQPA658-8 | 1,0                  | 0<br>0,31<br>0,44    | 11,8-11,9<br>9,5-9,6<br>10,5-10,6<br>11,2-11,6  |
|                           |                      | :                    |   |
| <u></u>                   | l                    |                      | 1   |

Notes

(1) when n

rev/min and gauge pressure =

bar (~ maximum full-load control rod travel)

'WPP 001/4 MAN 11,1 q 26 2. Edition

PES 6 P 120 A 720 LS 388 Z RQ 250/1100 PA 658-7 Komb.-Nr. 0 402 046 286 Values only apply to test nozzle-and-holder assembly 1 688 901 019 and fuel-injection test tubing 1 680 750 067

supersedes 10.83 MAN company:

D 2566 MK/SIB 235 kW/2200 min 1

MAN-Nr. 2-7463

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

### A. Fuel Injection Pump Settings

Control rod

11,3+0,

6,4-6,6

Rotational speed

1100

250

rev/min

Port closing at prestroke

| 95-3,15)   |   |                                  |  |  |
|--|---|----------------------------------|--|--|
| Fuel delivery<br>cm <sup>3</sup> /100 strokes<br>3 | Difference<br>cm <sup>3</sup> /<br>100 strokes<br>4 | Control rod<br>travel<br>mm<br>2 | Fuel delivery<br>cm <sup>3</sup> /100 strokes<br>3 | Spring pre-tensioning<br>(torque-control valve)<br>mm<br>6 |
|  | 0,5(0,9)  |                                  | •  |  |
| 1,2-1,8  | 0,8(1,2)  |                                  |  |  |

Adjust the fuel dativery from each outlet according to the values in

**B. Governor Settings** 

| PRG che | Control rod         | Full-load :<br>Setting por<br>rev/min<br>3 | *    | - | rev/min                         | tdle spec<br>Setting p<br>rev/min<br>7 | Control<br>red travel | Test spe | cifications 5<br>Control rod<br>travel<br>mm | rev/min                   | Control rod (3)                                 |
|---------|---------------------|--|------|---|---------------------------------|--|-----------------------|----------|--|---------------------------|---|
|         | 19,2-20,8<br>x. 46° | 600  | 20,0 |   | 1145-1160<br>1185-1215<br>0-1,0 |  | 6,5                   | 250      | min.8,0<br>6,4-6,6<br>75=2,0                 | 1100<br>750<br>865<br>970 | 1,3-11,4<br>12,4-12,5<br>12,2-12,4<br>11,5-11,8 |

Torque-control travel on flyweight assembly dimension a =

1145-1160 min ' Speed regulation: At

1 mm less control rod travel

### C. Settings for Fuel Injection Pump with Fitted Governor

|              | lelivery on<br>control lever<br>np. 40°C (104°F) | Control rod stop 3a | Fuel deliv | ery characteristics (3b)                 | Starting f   | d Contre  |
|--------------|--|---------------------|------------|--|--------------|---|
| rev/min<br>1 | cm³/-1000 strokes                                | rev/min             | rev/min    | cm <sup>3</sup> /-1000 strokes<br>5      | rev/min<br>6 | red travel<br>cm <sup>3</sup> /1000 strokes:/ mm<br>7 |
| LDA<br>1100  | 0,7 bar<br>179,0-181,0<br>(176,0-184,0)          | -                   | LDA<br>500 | 0,33 bar<br>146,0-152,0<br>(143,0-155,0) |              | 205,0-225,0<br>201,0-229,0)                           |
| LDA<br>750   | 0,7 bar<br>197,0-203,0<br>(194,0-206,0)          |                     | LDA<br>500 | 0 bar<br>103,0-105,0<br>(100,0-108,0)    | 250          | 12,0-18,0<br>(9,0-21,0)                               |

Checking values in brackets

MAN 11,1 q 26

Test at n 🐇

500

rev/min decreasing pressure - in bar gauge pressure

| Pump/governor                 | Setting              | Measurement          | diminution<br>Control rod travel-<br>difference |
|-------------------------------|----------------------|----------------------|---|
|                               | Gauge pressure - bar | Gauge pressure = bar | mm (1) .  |
| PES 6 PLS 388 Z<br>RQPA 658-7 | 0,70                 | 0<br>0,33<br>0,43    | 12,4-12,5<br>9,4-9,5<br>10,9-11,0<br>11,4-11,8  |

Notes

(1) when n

rev/min and gauge pressure =

bar (= maximum full-load control rod travel)

# Test Specifications Fuel Injection Pumps (1) and Governors

MPP 001/4 SCA 8,0 e

8. Edition

E

PE6P110 A 720 RS 393

ROV 200-1200 PA 467

company: Scania engine. DN 801

Komb.-Nr. 0 401 846 424

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

## A. Fuel Injection Pump Settings

| Port closing at pres     |          | 95-3.15)                                      | mm (from BDC)                     |                                  |  |  |
|--------------------------|----------|---|-----------------------------------|----------------------------------|--|--|
| Rotational speed rev/min |          | Fuel delivery  cm <sup>3</sup> /100 strokes 3 | Difference<br>cm³/<br>100 strokes | Control rod<br>travel<br>mm<br>2 | Fuel delivery<br>cm <sup>3</sup> /100 strokes<br>3 | Spring pre-tensioning<br>(torque-control valve)<br>mm<br>6 |
| 600                      | 12,0+0,1 | 8,7-8,9                                       | 0,5(0,7)                          |                                  |  | 2,5 <sup>+</sup> 0,1                                       |
| 225                      | 5,9 -7,1 | 1,1-1,5                                       | 0,2(0,4)                          |                                  |  | (2,2-2,9)  |
|                          |          |   | İ                                 |                                  |  |  |
|                          |          |   | 1                                 |                                  |  |  |

Adjust the fuel delivery from each outlet according to the values in

### **B. Governor Settings**

| Upper rated :                         | speed                                  |                                   | Intermediate                                   | rated sp | 1                             | Lower rated                                    | speed        |                               | Sliding s     | leeve travel       |
|---------------------------------------|--|-----------------------------------|--|----------|-------------------------------|--|--------------|-------------------------------|---------------|--------------------|
| Degree of deflection of control lever | rev/min<br>Control<br>rod travel<br>mm | travel (a)                        | Degree of<br>deflection<br>of control<br>lever | rev/min  | control rod<br>travel<br>mm 4 | Degree of<br>deflection<br>of control<br>lever | rev/min<br>8 | Control rod<br>travel<br>mm 3 | rev/min<br>10 | (1)<br>mm<br>11    |
| max.                                  | 1200                                   | 15,2-17,8                         | •  | -        | -                             | ca.16  | 100          | min.8,4                       |               | 0,5-0,8<br>3,6-4,2 |
| ca.61                                 | 11,0<br>4,0<br>1500                    | 1240-1250<br>1365-1395<br>0 - 1,0 |  |          |                               |  | 225<br>440-5 | 6,9-7,1<br>00= 2,0            | 850<br>1200   | 5,8-6,0<br>8,2     |
|                                       |  |                                   |  |          |                               | <b>3</b>                                       |              |                               |               |                    |

Torque control travel a =

mm

### C. Settings for Fuel Injection Pump with Fitted Governor

| Full-load de<br>Control-roc<br>Test oil terr |                          | infermediate speed |         | rery characteristics 50 peed (50) | Starting<br>Idle<br>switchir |                                    | Torque- | control 5  Control rod travel |
|--|--------------------------|--------------------|---------|-----------------------------------|------------------------------|------------------------------------|---------|-------------------------------|
| rev/min                                      | cm³/1000 strokes         | rev/min 4          | rev/min | cm <sup>3</sup> /1000 strokes     | rev/min                      | cm <sup>3</sup> /1000 strokes      | rev/min |                               |
| 1  | 2                        | 3                  | 4       | 5                                 | 6                            | 7                                  | 8       | 9                             |
| 600<br>ც                                     | 87,0-89,0<br>(85,0-91,0) | 1240-1250*         | 1200    | 98,5-103,5<br>(96,0-106,0)        | 100                          | 140,0-190,0<br>=20,0-21,0<br>mm RN | -       | -                             |

Checking values in brackets

\* 1 mm less control rod travel than col 2

Test Specifications
Fuel Injection Pumps ①
and Governors

WPP 001/4 SCA 8,0 e 1

5. Edition

PE6PI10A 720 RS 393

RQV 250-1200 PA469

supersed@ .83

company Scania engine. DN 801

Komb.-Nr. 0 401 846 423

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

### A. Fuel Injection Pump Settings

| Rotational speed rev/min | Control rod<br>travel<br>mm<br>2 | Fuel delivery  cm³/100 strokes 3 | Difference<br>cm <sup>3</sup> /<br>100 strokes<br>4 | Control rod<br>travel<br>mm<br>2 | Fuel delivery<br>cm <sup>3</sup> /100 strokes<br>3 | Spring pre-tensioning (torque-control valve) mm 6 |
|--------------------------|----------------------------------|----------------------------------|---|----------------------------------|--|---|
| 600                      | 12,0+0,1                         | 8,7-8,9                          | 0,5(0,7)  |                                  |  | 2,5 + 0,1   |
| 225                      | 6,9-7,1                          | 1,1-1,5                          | 0,2(0,4)  |                                  |  | (2,2-2,9)   |
|                          |                                  |                                  |   |                                  |  |   |
|                          |                                  |                                  |   |                                  |  |   |

Adjust the fuel delivery from each outlet according to the values in

### **B.** Governor Settings

| Upper rated                                    | peed                |  |     | Intermediate                          | rated sp |                               | Lower rated                           | speed   |                               | Sliding s          | eeve travel               |
|--|---------------------|--|-----|---------------------------------------|----------|-------------------------------|---------------------------------------|---------|-------------------------------|--------------------|---------------------------|
| Degree of<br>deflection<br>of control<br>lever | rodtravel           | Control rod<br>travel<br>mm<br>rev/min | (a) | Degree of deflection of control lever | rev/min  | Control rod<br>travel<br>mm 4 | Degree of deflection of control lever | rev/min | Control rod<br>travel<br>mm 3 | rev/min            | (1)<br>mm<br>11           |
| max.   | 1200                | 15,2-17                                | .8  | - :                                   | -        | •                             | ca.13                                 | 100     | min.8,4                       | 200                | 0,7-0,9                   |
| ca.51  | 11.0<br>4.0<br>1450 | 1240-12<br>1325-13<br>0 - 1,           | 55  | E SA                                  |          |                               |                                       |         | 6,9-7,1<br>395=2,0            | 500<br>800<br>1200 | 3,0-3,5<br>5,1-5,3<br>8,3 |
|  |                     |  |     |                                       |          |                               | 39                                    |         |                               |                    |                           |

Torque control travel a = - mn

### C. Settings for Fuel Injection Pump with Fitted Governor

| Full-load d<br>Control-ro<br>Test oil ter |                          | Rotational-speed 20 timitation intermediate speed | Fuel deliv | very characteristics 5e peed 5b | Starting<br>idle<br>switching |                                    | Torque-<br>travei | Control cod |
|---|--------------------------|---|------------|---------------------------------|-------------------------------|------------------------------------|-------------------|-------------|
| rev/min                                   | cm³/1000 strokes         | rev/min 4a  | rev/min    | cm <sup>3</sup> /1000 strokes   | rev/min                       | cm <sup>3</sup> /1000 strokes      | rev/min           |             |
| ,   | 2                        | 3   | 4          | 5                               | 6                             | 7                                  | 8                 | 9           |
| 500                                       | 87.0-89.0<br>(85.0-91.0) | 1240-1250*  | 1200       | 98,5-103,5<br>(96,0-106,0)      | 100                           | 140,0-190,0<br>=20,0-21,0<br>mm R! | •                 | -           |

Checking values in brackets

\* 1 mm less control rod travel than col 2

Test Specifications
40
Fuel Injection Pumps 2 NPP 001/4 SCA 8,0 n 1 and Governors

En

supersede10.83 companyScania engine DN 8 01

PE 6 P 110 A 720 RS 393

Kom.-Nr. 0 401 846 479

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

### A. Fuel Injection Pump Settings

Port closing at prestroke

12 95-3 151

mm (from BDC)

RQ 750 PA 528

|                          |                                  | (2,33-3,13)  |   |                                  |  |  |
|--------------------------|----------------------------------|--|---|----------------------------------|--|--|
| Rotational speed rev/min | Control rod<br>travel<br>mm<br>2 | Fuel delivery<br>cm <sup>3</sup> /100 strokes<br>3 | Difference<br>cm <sup>3</sup> /<br>100 strokes<br>4 | Control rod<br>travel<br>mm<br>2 | Fuel delivery<br>cm <sup>3</sup> /100 strokes<br>3 | Spring pre-tensioning<br>(torque-control valve)<br>mm<br>6 |
| 700                      | 12,0+0,1                         | 9,0-9,2  | 0,5(0,7)  |                                  |  |  |
|                          |                                  |  |   |                                  |  |  |
|                          |                                  |  |   |                                  |  |  |
|                          |                                  |  |   |                                  |  |  |

Adjust the fuel delivery from each outlet according to the values in

### **B.** Governor Settings

| Checking PRG che | g of slider<br>ck (         | Full-load s<br>Setting po |                             |                              | cifications (4)               | Idle spec<br>Setting p | _                                 |                | cifications (5)             | Torque o | (3)    |
|------------------|-----------------------------|---------------------------|-----------------------------|------------------------------|-------------------------------|------------------------|-----------------------------------|----------------|-----------------------------|----------|--------|
| rev/min          | Control rod<br>travel<br>mm |                           | Control<br>rad travel<br>mm | Control<br>red travel<br>rmm | rev/min                       | 1                      | Control<br>rod travel<br>rnm<br>8 | rev/min<br>9   | Control rod<br>traval<br>mm | rev/min  | travel |
| -                | •                           | •                         | •                           | 11,0<br>4,0<br>850           | 750-755<br>784-797<br>0 - 1,0 | -                      | -                                 | <del>-</del> - | -                           | -        | / -    |

Torque-control travel on flyweight assembly dimension a =

Speed regulation: #50-755 min-1

1 mm less control rod travel

### C. Settings for Fuel Injection Pump with Fitted Governor

|         | elivery on control lever np 40°C (104°F) | Control rod stop 3a | Fuel delive | ery characteristics 3b              | Starting f | uel delivery   |
|---------|--|---------------------|-------------|-------------------------------------|------------|--|
| rev/min | cm <sup>3</sup> /-1000 strokes           | rev/min<br>3        | rev/min     | cm <sup>3</sup> /-1000 strokes<br>5 | rev/min    | red travel<br>cm <sup>3</sup> /1000 strokes:/ min<br>7 |
| 700     | 90,0-92,0<br>(88,0-94,0)                 | -                   | -           | -<br>:                              | 100        | 140,0-190,0<br>= 20,0-21,0<br>mm RW                    |

Checking values in brackets

7.84

**D18** 

Geschaftsbereich KH. Kundendienst. Kfz-Ausrüstung.

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Testoil-ISO 4113

# Test Specifications Fuel Injection Pumps 2 and Governors

WPP 001/4 SCA 8.0 n 3. Edition

PE & P 110 A 720 RS 393 Komb.-Nr. 0 401 846 480

RO 900 PA 528

superseded. 83 Scania DN 8 01

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

### A. Fuel Injection Pump Settings

Port closing at prestroke

mm (from BDC)

|                  | T                           | 90-0,101                                    |                                   |                             | <del></del>                                 | <del></del>   |
|------------------|-----------------------------|---|-----------------------------------|-----------------------------|---|---|
| Rotational speed | Control rod<br>travel<br>mm | Fuel delivery  cm <sup>3</sup> /100 strokes | Difference<br>cm³/<br>100 strokes | Control rod<br>travel<br>mm | Fuel delivery  cm <sup>3</sup> /100 strokes | Spring pre-tensioning<br>(torque-control valve)<br>mm |
| 050              | 12,0+0,1                    | 9,4-9,6                                     | 0,5 (0,7)                         |                             |   |   |
| 850              | 12,0+0,1                    | 9,4-9,0                                     | 0,5 (0,7)                         |                             |   |   |
|                  |                             |   |                                   |                             |   |   |
|                  |                             |   |                                   |                             |   |   |
|                  |                             |   |                                   |                             |   |   |
|                  |                             |   |                                   |                             |   |   |

Adjust the fuel delivery from each outlet according to the values in

### **B. Governor Settings**

| Checkin      | g of slider<br>ck                | Full-load s  |                         | •                                | cifications (4)             | Idle spec    | -                                 |         | cifications (5)                   | Torque o | control 3 |
|--------------|----------------------------------|--------------|-------------------------|----------------------------------|-----------------------------|--------------|-----------------------------------|---------|-----------------------------------|----------|-----------|
| rev/min<br>1 | Control rod<br>travel<br>mm<br>2 | rev/min<br>3 | Control red travel mm 4 | Control<br>red travel<br>mm<br>5 | rev/min                     | rev/min<br>7 | Control<br>rad travel<br>mrm<br>8 | rev/min | Control rod<br>travel<br>mm<br>10 | rev/min  | travel    |
| •            | -                                | •            | -                       | 11,0<br>4,0<br>1000              | 900-905<br>941-955<br>0-1,0 | -            | ı                                 | •       | -                                 | •        | •         |

Torque-control travel

900-905 min-1

1 mm less control

### C. Settings for Fuel Injection Pump with Fitted Governor

| governor     | lelivery on<br>control lever<br>mp_40°C (104°F) | 2 | Control rod stop | <b>3</b> a | Fuel delivery characteristics |                        |  | Starting fuel delivery Idle speed |   |  |
|--------------|---|---|------------------|------------|-------------------------------|------------------------|--|-----------------------------------|---|--|
| rev/min<br>1 | cm <sup>3</sup> /~1000 strokes<br>2             |   | rev/min<br>3     |            | rev/min<br>4                  | cm³/-1000 strokes<br>5 |  | rev/min<br>6                      | red travel<br>cm <sup>3</sup> /1000 strokes / mm<br>7 |  |
| 850          | 94,0-96,0<br>(92,0-98,0)                        |   | -                |            | -                             | -                      |  | 100                               | 140,0-190,0<br>= 20,0-21,0<br>mm RW                   |  |

Checking values in brackets

Testoil-ISO 4113

## **Test Specifications** Fuel Injection Pumps 2 and Governors

WPP 001/4 DAF 11,6 n 3

2. Edition

PE 6 P 110 A 320 RS 407-1 Komb.-Nr. 0 401 846 469

RO 250/1100 PA 428/2 R

supersedes 12.82 DAF company. **DKTL 1160** 185 kW

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke

(2,75-2,95)

mm (from BDC)= RW 9.0 - 12.0 mm

| Rotational speed<br>rev/min<br>1 | Control rod<br>travel<br>mm<br>2 | Fuel delivery<br>cm <sup>3</sup> /100 strokes<br>3 | Difference<br>cm <sup>3</sup> /<br>100 strokes<br>4 | Control rod<br>travel<br>mm<br>2 | Fuel delivery  cm <sup>3</sup> /100 strokes 3 | Spring pre-tensioning<br>(torque-control valve)<br>mm<br>6 |
|----------------------------------|----------------------------------|--|---|----------------------------------|---|--|
| 850                              | 12,3+0,1                         | 14,1-14,4  | 0,4 (0,75   | ·                                |   |  |
| 250                              | 7,1-7,3                          | 1,0-1,4  | 0,45(0,75   |                                  |   |  |
|                                  |                                  |  |   | •                                |   |  |
|                                  |                                  |  |   |                                  |   |  |

Adjust the fuel delivery from each outlet according to the values in

### **B. Governor Settings**

| Checkin<br>PRG che | •                                | Full-load s<br>Setting po | •                           | •                                 | cifications (4)                   | Idle spec    | -                            |                    | cifications (5)                  | Torque o    | control (3)          |
|--------------------|----------------------------------|---------------------------|-----------------------------|-----------------------------------|-----------------------------------|--------------|------------------------------|--------------------|----------------------------------|-------------|----------------------|
| rev/min            | Control rod<br>travel<br>mm<br>2 |                           | Control<br>red travel<br>mm | Centrel<br>red travel<br>rnm<br>5 | rev/min                           | rev/min<br>7 | Centrel<br>rad travel<br>rmm |                    | Control rod<br>travel<br>mm      | rev/min     | Control rod          |
| 600                | 15,6-16,4                        | 600                       | 16,0                        | 11,3<br>4,0<br>1350               | 1145-1160<br>1200-1230<br>0 - 1,0 |              | 7,2                          | 100<br>250<br>345- | min. 7,8<br>7,1-7,3<br>385 = 2,0 | 850<br>1100 | 12,3+0,1<br>12,2+0,2 |
|                    |                                  |                           |                             |                                   |                                   |              |                              | 4445               | 1160 min-                        |             |                      |

Torque-control travel on flyweight assembly dimension a =

Speed regulation: At

1 mm less control rod travel

### C. Settings for Fuel Injection Pump with Fitted Governor

| governor     | delivery on control lever mp 40°C (104°F) | Control rod stop 3a | Fuel deliv   | ery characteristics 3b                | Starting t     | uel delivery d Contre                               |
|--------------|---|---------------------|--------------|---------------------------------------|----------------|---|
| rev/min<br>1 | cm <sup>3</sup> /-1000 strokes<br>2       | rev/min<br>3        | rev/min<br>4 | cm <sup>3</sup> /~1000 strokes<br>5   | rev/min  <br>6 | cm <sup>3</sup> /1000 strokes:/ mm                  |
| LDA<br>850   | 0,5 bar<br>140,5-143,5<br>(138,0-146,0)   | ~                   | LDA<br>600   | 0 bar<br>136,5-139,5<br>(134,0-142,0) | 100            | 245,0-285,0<br>(241,0-289,0)<br>=19,5-21,0 mm<br>RW |

Checking values in brackets

5.84

BOSCH

DAF 11,6 n 3

Test at n

600

rev/min decreasing pressure – in bar gauge pressure

| Pump/governor | Setting              | Measurement          | diminution Control rod travel- difference |
|---------------|----------------------|----------------------|---|
|               | Gauge pressure = bar | Gauge pressure = bar | mm (1)                                    |
| PE6PRS407-1   | 0,30                 |                      | 12,1 - 12,2                               |
| + RQPA 428/2R |                      | 0,50                 | 12,3 - 12,4                               |
|               |                      | 0                    | 12,0 - 12,1                               |
|               |                      |                      |   |
|               |                      |                      |   |
|               |                      |                      |   |

Notes

(1) when n

rev/min and gauge pressure =

bar ( maximum full-load control rod travel)

# Test Specifications Fuel Injection Pumps (A) and Governors

40

WPP 001/4 DAF 11,6 v 2. Edition

Εn

PE6P110 A 320 RS 407-1

RSV 275-1000 P5/458-3

supersed 3.84 company DAF

Komb.-Nr. 0 401 876 275

engine DKCL 1160

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

### A. Fuel Injection Pump Settings

Port closing at prestroke (2,75- 2,95)

mm (from BQC)RW = 9,0 - 12,0 mm

| Rotational speed | Control rod | Fuel delivery        | Difference                           | Control rod<br>travel | Fuel delivery   | Spring pre tensioning (forque control valve) |
|------------------|-------------|----------------------|--------------------------------------|-----------------------|-----------------|--|
| rev/min          | mm <b>2</b> | cm /100 strokes<br>3 | cm <sup>-/</sup><br>100 strokes<br>4 | mm<br>2               | cm·/100 strokes | mm<br>6                                      |
| 600              | 12.3+0.1    | 14.0-14.3            | 0,4 (0,75)                           |                       |                 |  |
| 275              | 7,0-7,2     | 0,9 - 1,4            | 0,45(0,75)                           | j                     |                 |  |
|                  |             |                      |                                      |                       |                 |  |
|                  |             | ,                    |                                      |                       |                 |  |

Adjust the fuel delivery from each outlet according to the values in

### **B.** Governor Settings

|       | r rateri speed<br>Control rod<br>travel<br>mm |                                   | Interme | diate rated | speed 6 | Control-<br>tever<br>deflection<br>in degrees<br>7 | Lower<br>rev/min<br>8 | rated speed<br>Control rod<br>travel<br>mm | 9           | rque control<br>Control rod<br>travel<br>mm |
|-------|---|-----------------------------------|---------|-------------|---------|--|-----------------------|--|-------------|---|
| loose | 800<br>x =                                    | 0,3-1,0<br>= 4,5                  | •       | -           | -       | ca.23  | 275<br>275            | 6,6<br>7,0-7,2                             | 600<br>1000 |   |
| 2a.48 | 10,1<br>4,0<br>1325                           | 1040-1050<br>1160-1190<br>0,3-1,7 | l       |             |         |  | 675-73                | 5 = 2,0                                    | 750<br>850  |   |

The numbers denote the sequence of the tests

### C. Settings for Fuel Injection Pump with Fitted Governor

|            | ull load stop<br>emp 40 C (104 F)      | 6 Rotational-<br>speed limital |                           | 3a Fuel delivery characteristics   |            | iuel delivery 5                                  | 4a) Idle stop |                   |  |
|------------|--|--------------------------------|---------------------------|--|------------|--|---------------|-------------------|--|
| revimin    | cm:/1000 strokes                       | changed to 1 rev/min 3         | rev/min                   | cm/1000 strokes<br>5   | rev/min    | cm//1000 strokes<br>7                            | rev/min<br>8  | travel<br>mm<br>9 |  |
| LDA<br>600 | 0,7 bar<br>139,5-142,5<br>137,0-145,0) | 1040-1050*                     | LDA<br>1090<br>LDA<br>600 | 0,7 bar<br>114,5-119,5<br>(111,5-122,5)<br>0 bar<br>136,5-139,5<br>(133,5-142,5) | 100<br>275 | 245,0-265<br>(241,0-269<br>9,0-14,0<br>(6,5-16,5 | 0)            | -                 |  |

Checking values in brackets

\* 1 mm less control rod travel than col 2

BOSCH

| restatin 600  | revimin increasing pressure - in | bar gauge pressure | DAF 11,6 v                                |
|---------------|----------------------------------|--------------------|---|
| Pump/governor | Setting                          | Measurement        | diminution Control rod travel- difference |
|               | Gauge pressure bar               | Gauge pressure bar | mm (1)                                    |
| PE6PRS 407-1  | 0,70                             | is a               | 12,3-12,4                                 |
| +PSVP5/458-3  |                                  | 0<br>0,28          | 12,1-12,2<br>12,2-12,3                    |
|               |                                  |                    |   |
|               |                                  |                    |   |
|               |                                  |                    |   |

tintes

(1) when o

revimin and gauge pressure

bar ( maximum full-load control rod travel)

# Test Specifications Fuel Injection Pumps (1) and Governors

WPP 001/4 RVI 8,8 b 1 c. Edition

En

PES 6 P 120 A 320 RS 417 ROV 300-1150 PA 527 K

Values only apply to test nozzle-and-holder assembly 1 688 901 019 and fuel-injection test tubing 1 680 750 067

supersed 3.83 company RVI engine MIDS 062030 158 kW (215 PS) Komb.-Nr. 0 402 046 226

Port-closing mark 10,5° camshaft after port closing of cylinder 1.

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

| Rotational speed rev/min | Control rod<br>travel<br>mm<br>2 | Fuel delivery<br>cm <sup>3</sup> /100 strokes<br>3 | Difference<br>cm <sup>3</sup> /<br>100 atrokes<br>4 | Control rod<br>travel<br>mm<br>2 | Fuel delivery<br>cm <sup>3</sup> /100 strokes<br>3 | Spring pre-tensioning<br>(torque-control valve)<br>mm<br>6 |
|--------------------------|----------------------------------|--|---|----------------------------------|--|--|
| 1150                     | 8,5-8,6                          | 14,6-14,8  | 0,5(0,9)  |                                  |  |  |
| 600                      | 2,6-2,8                          | 1,3- 1,9   | 0,8(1,2)  |                                  |  |  |
|                          |                                  |  |   |                                  |  |  |
|                          |                                  |  |   |                                  |  |  |

Adjust the fuel delivery from each outlet according to the values in

### **B. Governor Settings**

| Upper rated s | peed               |  | Intermediate                          | rated sp     | eed                     | Lower rated   | speed   |                               | Slidings    | leeve trav <del>ol</del> |
|---------------|--------------------|--|---------------------------------------|--------------|-------------------------|---|---------|-------------------------------|-------------|--------------------------|
| deflection    | Control rod travel | Control red (a) travel mm rev/min (2a) | Degree of deflection of control lever | rev/min<br>5 | Control rod travel mm 4 | Degree of<br>deflection<br>of control<br>lever<br>7 | rev/min | Control rod<br>travel<br>mm 3 | rev/min     | 0                        |
| max.          | 1200               | 15,2-17,8                              | -                                     | •            | -                       | ca.10   |         |                               |             | ),4-9,7<br>3,6-3,7       |
| ca. 57        | 7,5<br>4,9<br>1409 | 1205-1215<br>1275-1305<br>9-1,9        |                                       |              |                         | 330-445<br>③  |         |                               | 857<br>1150 | 5,1-5,2<br>7,5           |

Torque control travel a =

mm

### C. Settings for Fuel Injection Pump with Fitted Governor

| Full-load delivery<br>Control-rod stop<br>Test oil temp 40°C (104°F) |  | Rotational-speed (2b) Fuel imitation intermediate speed |            | ide speed (G)  |         | fuel delivery 6  | Torque-<br>travel | Control 5                                |
|--|--|---|------------|--|---------|--|-------------------|--|
| rev/min  | cm³/1000 strokes                               | rev/min 49  | rev/min    | cm³/1000 strakes                                       | rev/min | cm³/1000 strokes                                       | rev/min           | travel<br>mm<br>9                        |
| 1150   | 14 <i>5</i> ,5-147,5<br>(14 <i>2</i> ,5-150,5) | 1205-1215*  | /5ባ<br>5ባባ | 125,0-131,0<br>(122,0-134,0<br>71,0-77,0<br>(68,0-80,0 |         | 125,0-145,0<br>121,0-149,0<br>18,0-24,0<br>(15,0-27,0) | 350<br>750        | 8,5+0,1<br>6,8+0,4<br>7,6+0,1<br>7,0+0,2 |

Checking values in brackets

\* 1 mm less control rod travel than col 2

5.84

BOSCH

# Test Specifications Fuel Injection Pumps (A) and Governors

40

WPP 001/4 DAF 11,6 v 1 2. Edition

En

PE6P 110 A 320 RS 407-1 Komb.-Nr. 0 401 876 276 RSV 275-1100 P 5/458-4

supersedes 3.84

company DAI

engine

**DKTL 1160** 

185 kW

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke (2,75-2,95)

mm (from BDG) RW = 9,0 - 12,0 mm

| Rotational | Control rod | Fuel delivery    | Difference                      | Control rod travel | Fuel delivery  | Spring pre tensioning (torque-control valve) |
|------------|-------------|------------------|---------------------------------|--------------------|----------------|--|
| rev/min    | mm 2        | cm //100 strokes | cm <sup>-/</sup><br>100 strokes | mm<br>2            | cm/100 strokes | mm<br>6                                      |
| 850        | 12,3+0,1    | 14,1-14,4        | 0,4 (0,75)                      |                    |                |  |
| 275        | 7,0-7,2     | 1,0-1,5          | 0,45(0,75)                      |                    |                |  |
|            |             |                  |                                 |                    |                |  |
|            |             |                  |                                 |                    |                |  |

Adjust the fuel delivery from each outlet according to the values in

### **B.** Governor Settings

|  | Upper rated speed rev/min   |                                     |   | Intermediate rated speed |   |  | Lower      | rated speed                 | Torque control |                        |  |
|--|-----------------------------|-------------------------------------|---|--------------------------|---|--|------------|-----------------------------|----------------|------------------------|--|
| Degree of<br>deflection<br>of control<br>lever | Control rod<br>travel<br>mm | Control rod<br>travel<br>mm rev/min | a | 5                        | 6 | Control-<br>lever<br>deflection<br>in degrees<br>7 | rev/min    | Control rod<br>travel<br>mm | rev/min        | travel<br>mm           |  |
| loose  | 800<br>x =                  | 0,3 - 1,0<br>3,25                   | - | -                        | • | ca. 18   | 275<br>275 | 6,6<br>7,0-7,2              | 400<br>300     | 12,5-12,6<br>12,7-13,2 |  |
| ca. 47   | 11,3<br>4,0<br>1350         | 1135-1145<br>1275-1305<br>0,3- 1,7  |   |                          |   |  | 675 -      | 45 =2,0                     |                |                        |  |

The numbers denote the sequence of the tests

### C. Settings for Fuel Injection Pump with Fitted Governor

| (2b) Full-load stop |  | 6 Rotational speed limital           | speed limital Characteristics |                                       |            | uel delivery 5                                     | 4a) Idle stop |                   |
|---------------------|--|--------------------------------------|-------------------------------|---------------------------------------|------------|--|---------------|-------------------|
| Test oil to         | emp 40 C (104°F)<br>cm//1000 strokes<br>2      | Note<br>changed to )<br>rev/min<br>3 | rev/min                       | cm <sup>2</sup> /1000 strokes<br>5    | rev/min    | cm/1000 strokes<br>7                               | rev/min<br>8  | travel<br>mm<br>9 |
| LDA<br>850          | 0,7 bar<br>1 <b>40,5-143,</b> 5<br>138,0-146,0 | 1135-1145*                           | L.DA<br>600                   | 0 bar<br>136,5-139,5<br>(134,0-142,0) | 100<br>275 | 245,0-285,<br>241,0-289,<br>10,0-15,0<br>(7,5-17,5 | 0)            | -                 |

Checking values in brackets

\* 1 mm less control rod travel than col 2

BOSCH

Gaschaftsbereich KH. Kundendienst. Kfz-Ausrustung. 1980 by Robert Bosch GmbH. Postfach 50. D-7000 Stuttgart 1. Printed in the Federal Republic of Germany Imprime en République Fédérale d'Allemagne par Robert Bosch GmbH.

DAF 11,6 v 1 -2-

| Ŧ | est | at | n | - |
|---|-----|----|---|---|

rev/min decreasing pressure - in bar gauge pressure

| 600                          |                      |                      | d iAi   |
|------------------------------|----------------------|----------------------|---|
| Pump/governor                | Setting              | Measurement          | diminution<br>Control rod travel-<br>difference |
|                              | Gauge pressure = bar | Gauge pressure = bar | mm (1) ,  |
| PE6PRS 407-1<br>+RSVP5/458-4 | 0.70                 | 0<br>0,30            | 12,3 - 12,4<br>12,0 - 12,1<br>12,1 - 12,2       |
|                              |                      | •                    |   |
|                              |                      |                      |   |

Notes

(1) when n

rev/min and gauge pressure = bar (= maximum full-load control rod travel)

## **Test Specifications** Fuel Injection Pumps (A) and Governors

WPP 001/4 DAF 11,6 v 2 1. Edition

PE 6 P 110 A 320 RS 407-1

RSV 275-1000 P 5/458-5

supersedes

company

DAF **DKFL 1160** 

Komb.-Nr. 0 401 876 277

Note VDT-I-420/114!

engine 185 kW

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

# A. Fuel Injection Pump Settings

Port closing at prestroke (2,75-2,95)

mm (from BDC)

RW = 9.0 - 12.0 mm

| Rotational speed rey/mia | Control rod travel | Fuel delivery  cm\$100 strokes 3 | Difference<br>cm³/<br>100 strokes<br>4 | Control rod<br>travel<br>mm<br>2 | Fuel delivery cm <sup>2</sup> /100 strokes 3 | Spring pre-tensioning<br>(torque-control valve)<br>mm<br>6 |
|--------------------------|--------------------|----------------------------------|--|----------------------------------|--|--|
| 600                      | 12,8+0,1           | 15,1-15,4                        | 0,4 (0,75)                             | )                                |  |  |
| 275                      | 7,0-7,2            | 0,9-1,4                          | 0,45(0,75)                             | )                                |  |  |
|                          |                    |                                  |  |                                  |  |  |

Adjust the fuel delivery from each outlet according to the values in [

### **B. Governor Settings**

| Degree of deflection of control lever | r rated speed<br>Control rod<br>travel<br>mm | rev/min<br>Control rod<br>travel<br>mm rev/min | Intermed | hate rated | speed | Control-<br>lever<br>deflection<br>in degrees<br>7 | Lower<br>rev/min<br>8 | rated speed<br> Control rod<br> travel<br> mm<br> 9 | 1(3)               | rque control<br> Control rod<br> travel<br> mm |
|---------------------------------------|--|--|----------|------------|-------|--|-----------------------|---|--------------------|--|
| loose                                 | 800<br>x                                     | 0,3-1,0<br>5,0                                 | -        | -          | •     | ca. 25   |                       | 6,6<br>7,0-7,2<br>0=2,0                             | 600<br>1000<br>790 | 13,0-13,1<br>12,1-12,3<br>12,6-12,8            |
| ca.50                                 | 11,1<br>4,0<br>1360                          | 1040-1050<br>1195-1225<br>0,3-1,7              |          |            |       |  | . 30 70               |   | 865                | 12,2-12,5                                      |

The numbers denote the sequence of the tests

### C. Settings for Fuel Injection Pump with Fitted Governor

| (4)        | il-load stop                              | speed limitat Characteristics        |                           | Starting f   | uel delivery 5 | 4a Idle stop                       |              |                                  |
|------------|---|--------------------------------------|---------------------------|--|----------------|------------------------------------|--------------|----------------------------------|
| rev/min    | emp 40°C (104°F)<br>cm³/1000 strokes<br>2 | Note<br>changed to )<br>rev/min<br>3 | rev/min cm*/1000 strokes  |  | rev/min        | cm³/1000 strokes<br>7              | rev/min<br>8 | Control rod<br>travel<br>mm<br>9 |
| LDA<br>600 | 0,7 bar<br>151,0-154,0<br>(148,5-156,5)   | 1046-1050*                           | LDA<br>1000<br>LDA<br>600 | 0,7 bar<br>135,5-140,5<br>(132,5-143,5)<br>0 bar<br>136,5-139,5<br>(133,5-142,5) | 100            | 245-<br>285,0<br>(241,0-<br>289,0) | 275          | 7,1                              |

Checking values in brackets

# 1 mm less control rod travel than col 2 7.84

Geschaftsbereich KH. Kundendienst. Kfz-Ausrustung 

1980 by Robert Bosch GmbH. Postfach 50. D-7000 Stuttgart 1. Printed in the Federal Republic of Germany 
Imprime en Republique Federale d'Allemagne par Robert Bosch GmbH.

DAF 11,6 v 2

. 2 -

| Test | 21 | • | - |  |
|------|----|---|---|--|
|      |    |   |   |  |

600

rev/min decreasing pressure - in bar gauge pressure

| Pump/governor                | Setting              | Measurement          | diminution Control rod travet- difference        |
|------------------------------|----------------------|----------------------|--|
|                              | Gauge pressure - bar | Gauge pressure = bar | mm (1) .   |
| PE6PRS407-1<br>+ RSVP5/458-5 | 0,70                 | 0<br>0,30<br>0,26    | 12,8-12,9<br>12,1-12,2<br>12,6-12,7<br>12,3-12,5 |
|                              |                      | •                    |  |

Notes

(1) when n

rev/min and gauge pressure =

bar (= maximum full-load control rod travel)

# Test Specifications Fuel Injection Pumps ② and Governors

40

WPP 001/4 DAF 11,6 n 4 2. Edition

En

PE 6 P 110 A 320 RS 407-1 RQ 275/1000 PA 641-1 Komb.-Nr. 0 401 846 474

supersedes 2 · 82 company DAF DKCL 1160 engine: 155 kW

estcil-ISO 4113

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

2,8-2,9
Port closing at prestroke (2,75-2,95) mm (from BDC) RW 9,0-12,0 mm

| Rotational speed rev/min | Control rod<br>travel | Fuel delivery  cm <sup>3</sup> /100 strokes 3 | cm <sup>3</sup> / | Control rod<br>travel<br>mm<br>2 | Fuel delivery  cm <sup>3</sup> /100 strokes 3 | Spring pre-tensioning<br>(torque-control valve)<br>mm<br>6 |
|--------------------------|-----------------------|---|-------------------|----------------------------------|---|--|
| 600                      | 12,3+0,1              | 13,9-14,1                                     | 0,4(0,75)         | i                                |   |  |
| 275                      | 7,0-7,2               | 0,9-1,4                                       | 0,45(0,75         | )                                |   |  |
|                          |                       |   |                   | -                                |   |  |
|                          |                       |   |                   |                                  |   |  |

Adjust the fuel delivery from each outlet according to the values in

**B.** Governor Settings

| Checking<br>PRG che | g of slider                      | Full-to<br>Setting |                                    | Test spe                          | cifications (4)                   | idle spec    | point                 |              | cifications 5                  | Torque                   | (3)  |
|---------------------|----------------------------------|--------------------|------------------------------------|-----------------------------------|-----------------------------------|--------------|-----------------------|--------------|--------------------------------|--------------------------|--|
| rev/min<br>1        | Control rod<br>travel<br>mm<br>2 | rev/mi             | Central<br>red travel<br>n mm<br>4 | Centrel<br>red travel<br>rnm<br>5 | rev/min                           | rev/min<br>7 | red travel<br>mm<br>8 | rev/min<br>9 | Control rod<br>travel<br>mm    | rev/min                  | Control rod<br>travel<br>mm<br>12            |
| 600                 | 15,6-16,                         | 4 600              | 16,0                               |                                   | 1045-1060<br>1105-1135<br>0 - 1,0 | 275          | 7,1                   | 275          | min. 8,6<br>7,0-7,2<br>385=2,0 | 600<br>000<br>815<br>985 | 12,5+0,1<br>11,1+0,2<br>12,0+0,2<br>11,3+0,4 |
|                     | antroi travel                    |                    | 0,6                                | <u>L</u>                          | <u> </u>                          |              | 104                   | 5-106        | 0 min 1                        |                          | 1 mm less contro                             |

on flyweight assembly dimension a =

m Speed regu

1 mm less control rod travel

### C. Settings for Fuel Injection Pump with Fitted Governor

|              | elivery on<br>control lever<br>np. 40°C (104°F) | Control rod stop 3a | Fuel delive               | /24 \  | Starting fuel delivery delivery ldle speed |   |  |
|--------------|---|---------------------|---------------------------|--|--|---|--|
| rev/min<br>1 | cm <sup>3</sup> /-1000 strokes<br>2             | rev/min<br>3        | rev/min<br>4              | cm <sup>3</sup> /-1000 strokes<br>5  | rev/min<br>6                               | cm <sup>3</sup> /1000 strokes:/ mm<br>7             |  |
| LDA<br>600   | 0,7 bar<br>139,0-142,0<br>(136,5-144,5)         | -                   | LDA<br>1000<br>LDA<br>600 | 0,7 bar<br>114,5-119,5<br>(111,5-122,5)<br>0 bar<br>136,5-139,5<br>(134,0-142,0) | 100 (                                      | 245,0-285,0<br>241,0-289,0)<br>= 19,5-21,0<br>mm RW |  |

Checking values in brackets

DAF 11,6 n 4

Testatn -

600

rev/min decreasing pressure - in bar gauge pressure

| Pump/governor                    | Setting              | Measurement          | diminution Control rod travel- difference |  |  |  |
|----------------------------------|----------------------|----------------------|---|--|--|--|
|                                  | Gauge pressure = bar | Gauge pressure = bar | mm (1) .                                  |  |  |  |
| PE 6 P RS 407-1<br>+ RQ PA 641-1 | 0,28                 | 0,50                 | 12,2-12,3<br>12,3-12,4<br>12,1-12,3       |  |  |  |

Notes

(1) when n =

rev/min and gauge pressure =

bar (= maximum full-load control rod travel)

# Test Specifications Fuel Injection Pumps and Governors

WPP 001/4 DAF 11,6 o 2 2. Edition

PE 6 P 120 A 320 RS 415 Komb.-Kr. o 401 876 247 RSV 250-1100 P5/474

supersedes8.81

company DAF

DKS 1160 P

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

### A. Fuel Injection Pump Settings

| Rotational speed | Control rod<br>travel | Fuel delivery                | Difference          | Control rod<br>travel | Fuel delivery                | Spring pre-tensioning (torque-control valve) |
|------------------|-----------------------|------------------------------|---------------------|-----------------------|------------------------------|--|
| rev/min          | mm                    | cm <sup>3</sup> /100 strokes | cm³/<br>100 strokes | mm                    | cm <sup>3</sup> /100 strokes | mm   |
| 1                | 2                     | 3                            | 4                   | 2                     | 3                            | 6  |
| 650              | 11,9+0,               | 18,8 - 19,2                  | 0,5(0,9)            |                       |                              |  |
| 250              | 6,7-6,9               | 1,9 - 2,3                    | 0,65(0,9            | 5)                    |                              |  |
|                  |                       | <b>)</b> .                   |                     | 1                     |                              |  |
|                  |                       |                              |                     |                       |                              |  |
|                  | 1                     |                              |                     | l                     | 1                            | ]  |

Adjust the fuel delivery from each outlet according to the values in

### **B.** Governor Settings

| Upper                                 | rated speed |                             | Intermediate                          | rated spe | ed                          | 4 Lowe                                | r rated spe |                             | 3 Tor   | que controi                 |
|---------------------------------------|-------------|-----------------------------|---------------------------------------|-----------|-----------------------------|---------------------------------------|-------------|-----------------------------|---------|-----------------------------|
| Degree of deflection of control lever | rev/min     | Control rod<br>travel<br>mm | Degree of deflection of control lever | rev/min   | Control rod<br>travel<br>mm | Degree of deflection of control lever | rev/min     | Control rod<br>travel<br>mm | rev/min | Control rod<br>travel<br>mm |
| 1                                     | 2           | 3                           | 4                                     | 5         | 6                           | 7                                     | 8           | 9                           | 10      | 11                          |
| loose                                 | 800         | 0,3-1,0                     | -                                     | -         | •                           | ca.24                                 | 250         | 6,3                         | 650     | 12,1+0,<br>10,4+0,          |
|                                       | х =         | 5,75                        | ļ                                     |           |                             |                                       | 250         | 6,7-6,9                     | 800     | 11,5+0,<br>10,9+0,          |
| €a.53                                 | 9.4         | 1140-1150<br>1200-1230      | 1                                     |           |                             |                                       | 410-        | 75=2,0                      |         |                             |
|                                       | 4,0<br>1350 | 0,3 - 1,7                   |                                       |           |                             |                                       |             |                             |         |                             |

The numbers denote the sequence of the tests

### C. Settings for Fuel Injection Pump with Fitted Governor

| 2 Full-load stop              |  | 6 Rotational-<br>speed limitat.     | (00)                      |  |              | fuel delivery  | Sa) idle stop |                                  |
|-------------------------------|--|-------------------------------------|---------------------------|--|--------------|--|---------------|----------------------------------|
| Test oil temp<br>rev/min<br>1 |  | Note-<br>changed to<br>rev/min<br>3 | rev/min<br>4              | cm <sup>3</sup> /1000 strokes<br>5   | rev/min<br>6 | cm <sup>3</sup> /1000 strokes<br>7                   | rev/min<br>8  | Control rod<br>travel<br>mm<br>9 |
| LDA<br>650                    | 0,7 bar<br>188,0-192,0<br>185,0-195,0) | 1140-1150*                          | LDA<br>1100<br>LDA<br>600 | 0,7 bar<br>186,0-192,0<br>(182,5-195,5)<br>0 bar<br>133,0-137,0<br>(130,0-140,0) |              | 310,0-350,0<br>306,0-354,0<br>= 19,5 -<br>21,0 mm RW | )             | 6,8                              |

Checking values in brackets

\* 1 mm less control rod travel than col. 2

DAF 11,6 o 2

Test at n =

600

rev/min decreasing pressure ~ in bar gauge pressure

|   | _                   |
|---|---------------------|
| 1 | $\overline{\omega}$ |
| ı | -                   |
| 1 |                     |
| ı | 7                   |
| ł |                     |
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| ł | $\equiv$            |
| ı | <u>ō</u>            |
| ı | est                 |
| 1 | Ü                   |
| l | <u> </u>            |
|   | •                   |

| Pump/governor      | Setting              | Measurement          | diminution<br>Control rod travel-<br>difference |
|--------------------|----------------------|----------------------|---|
|                    | Gauge pressure - bar | Gauge pressure = bar | mm (1) .  |
| RS 415 with P5/474 | 0,7                  |                      | 11,9 - 12,0                                     |
| P5/4/4             |                      | 0,27                 | 11,4 - 11,5                                     |
|                    |                      | 0,12                 | 10,2 - 10,4                                     |
|                    |                      | 0                    | 9,8 - 9,9                                       |
|                    |                      | ·                    |   |
|                    |                      |                      |   |
|                    |                      |                      |   |

Notes

(1) when n =

rev/min and gauge pressure = bar (= maximum full-load control rod travel)

-

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WPP 001/4 DAF 11,6 y
1. Edition

<u>En</u>

PE 6 P 120 A 320 RS 415-1 Komb.-Nr. 0 401 846 493 RQ 250/1100 PA 417-2

supersedescompany.DAF engine DKV 1160

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

### A. Fuel Injection Pump Settings

Port closing at prestroke

(2.75-2.95

mm (from BDC)

| Rotational speed rev/min | Control rod travel | Fuel delivery  cm³/100 strokes 3 | Difference<br>ĉm³/<br>100 strokes<br>4 | Control rod<br>travel<br>mm<br>2 | Fuel delivery<br>cm <sup>3</sup> /100 strokes<br>3 | Spring pre-tensioning<br>(torque-control valve)<br>mm<br>6 |
|--------------------------|--------------------|----------------------------------|--|----------------------------------|--|--|
| 650                      | 11,6+0,1           | 17,9 - 18,3                      | 0,5 (0,9                               |                                  |  |  |
| 250                      | 6,2-6,4            | 1,1 - 1,5                        | 0,65(0,9                               | 5)                               |  |  |
|                          |                    |                                  | -                                      | <u> </u>                         |  |  |
|                          |                    |                                  |  |                                  |  |  |

Adjust the fuel delivery from each outlet according to the values in

### **B. Governor Settings**

| PRG che | Control rod travel | D  | Full-foad s<br>Setting po<br>rev/min<br>3 | •    | -                  | rev/min                           | Idle spec<br>Setting p<br>rev/min<br>7 | Control<br>red travel | Test spe | cifications 5<br>Control rod<br>travel<br>mm | rev/min     | Control rod                                    |
|---------|--------------------|----|---|------|--------------------|-----------------------------------|--|-----------------------|----------|--|-------------|--|
| 700     | 15,6 -10           | 6, | 700                                       | 16,0 | 9,6<br>4,0<br>1300 | 1135-1150<br>1190-1220<br>0 - 1,0 | i                                      | 6 <b>,</b> 3          | 250      | min.7,2<br>6,2 -6,4<br>475 = 2,0             | 1090<br>785 | 1,8-11,9<br>10,6-10,8<br>1,5-11,7<br>10,8-11,1 |

Torque-control travel on flyweight assembly dimension a =

0,55 <sub>mm</sub>

1135 - 1150 min<sup>-1</sup>

1 mm less control rad travel

### C. Settings for Fuel Injection Pump with Fitted Governor

| governor | delivery on-<br>control lever<br>mp 40°C (104°F) | Control rod stop 3a | Fuel delive  | ery characteristics 3b              | Starting fuel delivery Idle speed Control |   |  |
|----------|--|---------------------|--------------|-------------------------------------|---|---|--|
| rev/min  | cm <sup>3</sup> /~1000 strokes                   | rev/min<br>3        | rev/min<br>4 | cm <sup>3</sup> /-1000 strokes<br>5 | rev/min<br>6                              | red travel<br>cm <sup>3</sup> /1000 strokes / mm<br>7 |  |
| LDA      | 0,7 bar  | -                   | LDA          | 0,7 bar                             | 100                                       | 320,0 - 360,0   |  |
| 650      | 179,0 - 183,0                                    |                     | 1090         | 197,0 - 203,0                       |   | (316,0 - 364,0)                                       |  |
|          | (176,0 - 186,0)                                  |                     |              | (193,5 - 206,5)                     |   | = 19,5 - 21,0   |  |
|          |  |                     | LDA          | 0 bar                               |   | mm RW   |  |
|          |  |                     | 600          | 151,0 - 155,0<br>(148,0 - 158,0)    | 250                                       | 6,2 - 6,4 mmRW  |  |

Checking values in brackets

7.84

**BOSCH** 

DAF 11,6 y

-2-

| Test | at | n |  |
|------|----|---|--|

500 rev/min decreasing pressure – in bar gauge pressure

|                                 | Io                   | Measurement          | diminution   |
|---------------------------------|----------------------|----------------------|--|
| Pump/governor                   | Setting              | Measurement          | Control rod travel-                                      |
|                                 | Gauge pressure - bar | Gauge pressure = bar | mm (1)   |
| PE & PRS 415-1<br>+ RQ PA 417-2 | U,70                 | 0<br>0,44<br>0,35    | 11,6 - 11,7<br>10,5 - 10,6<br>11,3 - 11,4<br>10,7 - 10,9 |
|                                 |                      | •                    |  |

Notes

(1) when n

rev/min and gauge pressure =

bar ( = maximum full-load control rod travel)

E10

# Test Specifications Fuel Injection Pumps (A) and Governors

40

WFP 001/4 DAF 11,6 0 4 2. Edition

Er

PE 6 P 120 A 320 RS 415-1

RSV 250-1100 P5/474

supersedes 1.63

Komb.-Nr. 0 401 876 258

company DAF

Note VDT-I-420/114

Testcil-ISO 4113

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

### A. Fuel Injection Pump Settings

2,8-2,9 osing at prestroke (2,75-2,95)

mm (from BDC)

| Rotational<br>speed<br>rev/min | Control rod travel | Fuel delivery<br>cm1/100 strokes<br>3 | Difference<br>cm <sup>17</sup><br>100 strokes<br>4 | Control rod<br>travel<br>mm<br>2 | Fuel delivery<br>cm/100 strokes<br>3 | Spring pre-tensioning<br>(torque-control valve)<br>mm<br>6 |
|--------------------------------|--------------------|---------------------------------------|--|----------------------------------|--------------------------------------|--|
| 650                            | 11,9+0,1           | 18,8-19,2                             | 0,5(0,9)   |                                  |                                      |  |
| 250                            | 6,7-6,9            | 1,9-2,3                               | 0,65(0,95  | <b>)</b>                         |                                      |  |
|                                |                    |                                       |  |                                  |                                      |  |

Adjust the fuel delivery from each outlet according to the values in

### **B.** Governor Settings

| Upper rated speed rev/min . (Control rod) (Control rod) |                    |                      | Intermediate rated speed |   |   | Lower taled speed               |         |              | Torque control |              |
|---|--------------------|----------------------|--------------------------|---|---|---------------------------------|---------|--------------|----------------|--------------|
| deflection of control                                   | travel<br>mm       | travel<br>mm rev/min |                          | 1 |   | Control-<br>lever<br>deflection | rev/min | travel<br>mm | rev/min        | travel<br>mm |
| lever<br>1  | 2                  | 3                    | 4                        | 5 | 6 | in degrees<br>7                 | 8       | 9            | 10             | 11           |
| loose   | 800                | 0,3-1,0              | -                        | - | - | ca. 24                          | 250     | 6,3          | 650            | 12,1-12,2    |
|   | x =                | 5,0                  |                          |   |   |                                 | 250     | 6,7-6,9      | 1100           | 10,4-10,6    |
| 62.63   | 0.4                | 1140-1150            |                          |   |   |                                 | 410-475 | 2,0          | 800            | 11,5-11,7    |
| ca.53   | 9,4<br>4,0<br>1350 | 1200-1230<br>0,3-1,7 |                          |   |   |                                 |         |              | 900            | 10,9-11,2    |

The numbers denote the sequence of the tests

### C. Settings for Fuel Injection Pump with Fitted Governor

| Est oil temp 40°C (104°F) |   | Rotational-<br>speed limital 3a Fuel delivery<br>characteristics |                           |  | Starting fuel delivery 5 48 Idle stop |  |              |                   |
|---------------------------|---|--|---------------------------|--|---------------------------------------|--|--------------|-------------------|
| rev/min                   | cm //1000 strokes                       | changed to ) rev/min 3   | rev/min                   | cm <sup>3</sup> /1000 strokes<br>5   | rev/min<br>6                          | cm <sup>3</sup> /1000 strokes<br>7               | rev/min<br>8 | travet<br>mm<br>9 |
| LUA<br>650                | 0,7 bar<br>188,0-192,0<br>(185,0-195,0) | 1140-1150*   | LDA<br>1100<br>LDA<br>600 | 0,7 bar<br>186,0-192,0<br>(182,5-195,5)<br>0,bar<br>133,0-137,0<br>(130,0-140,0) | (                                     | 310,0-350,<br>306,0-354<br>= 19,5 -<br>21,0 mm R | ,0)          | -                 |

Checking values in brackets

\* 1 mm less control rod travel than col 2

**BOSCH** 

Geschaftsbereich KH. Kundendienst. Kfz-Ausrustung. 1980 by Robert Bosch. GmbH. Postfach 50. 0-7000 Stuttgart 1. Prinžed in the Federal Republic of Germany.

1984 - 1984

-2-

Testatn -

600

rev/min decreasing pressure - in bar gauge pressure

DAF 11,6 o 4

| Pump/governor                   | Setting              | Measurement          | diminution Control rod travel- difference      |
|---------------------------------|----------------------|----------------------|--|
|                                 | Gauge pressure = bar | Gauge pressure = bar | mm (1)   |
| PE 6 P RS 415-1<br>+ RSVP 5/474 | 0,27                 | 0,70<br>0<br>0,12    | 11,4-11,5<br>11,9-12,0<br>9,8-9,9<br>10,2-10,4 |

Notes

(1) when n =

rev/min and gauge pressure =

bar (= maximum full-load control rod travel)

## **Test Specifications** Fuel Injection Pumps 1 and Governors

WPP 001/4 RVI 8,8 b 2

3. Edition

ROV 300-1150 PA 527-1K PES 6 P 120 A 320 RS 417

Values only apply to test nozzle-and-holder assembly 1 688 901 019 and fuel-injection test tubing 1 680 750 067

superseded. 83

company:RVT engine: MIDR 062030

Komb.-Nr. 0 402 046 247

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

#### A. Fuel Injection Pump Settings

| Port closing at pres     |                             | 2,8-2,9<br>75_2 95)                                | mm (from BDC)                                       |                                  |  |  |
|--------------------------|-----------------------------|--|---|----------------------------------|--|--|
| Rotational speed rev/min | Control rod<br>travel<br>mm | Fuel delivery<br>cm <sup>3</sup> /100 strokes<br>3 | Difference<br>cm <sup>3</sup> /<br>100 strokes<br>4 | Control rod<br>travel<br>mm<br>2 | Fuel delivery<br>cm <sup>3</sup> /100 strokes<br>3 | Spring pre-tensioning<br>(torque-control valve)<br>mm<br>6 ~ |
| 1150                     | 8,5-8,6                     | 14,8-15,0  | 0,5 (0,9)   |                                  |  |  |
| 300                      | 4,1-4,3                     | 1,8-2,4  | 0,5 (0,9)   |                                  |  |  |
|                          |                             | k at 6° cam sha<br>el 9.0-12.0 mm.                 |   | port clos                        | ing for 1st. c                                     | vlinder at   |

Adjust the fuel delivery from each outlet according to the values in

#### **B.** Governor Settings

| Upper rated s | peed               |                    | Intermediate         | rated sp | eed         | Lower rated          | speed   |             | Sliding s | leeve travel |
|---------------|--------------------|--------------------|----------------------|----------|-------------|----------------------|---------|-------------|-----------|--------------|
|               | rev/min<br>Control | Control rod travel | Degree of deflection |          | Control rod | Degree of deflection |         | Control rod |           | ①            |
| of control    | rod travel         |                    | of control           | rev/min  | mm (4)      | of control           | rev/min | mm (3)      | rev/min   | mm           |
| 1             | 2                  | 3                  | 4                    | 5        | 6           | 7                    | 8       | 9           | 10        | 11           |
| max.          | 1200               | 15,2-17,8          | -                    | -        | -           | ca. 10               | 100     | min. 5,7    | 250       | 0,4-0,7      |
| ca. 58        | 7,5                | 1205-1215          |                      |          |             |                      | 300     | 4,1-4,3     | 550       | 3,6-3,7      |
|               | 4,0                | 1275-1305          | 1                    |          | ŀ           |                      |         |             | 850       | 5,1-5,2      |
|               | 1450               |                    |                      | 1        |             | 330-445              |         |             | 1150      | 7,5          |
|               | -                  |                    |                      |          |             | 30                   |         |             |           |              |

Torque control travel a =

## C. Settings for Fuel Injection Pump with Fitted Governor

| Full-load de<br>Control-red<br>Test oil ten |                             | Rotational-speed (2b) limitation intermediate speed | Fuel delin<br>high idle s | very characteristics (5e)     | Starting<br>idle<br>switchir | . •                           | Torque-<br>travel | control (5)        |
|---|-----------------------------|---|---------------------------|-------------------------------|------------------------------|-------------------------------|-------------------|--------------------|
| rev/min                                     | cm³/1000 strokes            | rev/min 4   | rev/min                   | cm <sup>3</sup> /1000 strokes | rev/min                      | cm <sup>3</sup> /1000 strokes | rev/min           | travel<br>mm       |
| 1   | 2                           | 3   | 4                         | 5                             | 6                            | 7                             | 8                 | 9                  |
| 1150  | 147,5-149,5<br>(144,5-152,5 |   | 750                       | 132,0-138,0<br>(129,0-141,0   |                              | 120,0-140,0<br>(116,0-144,0   |                   |                    |
|   |                             |   | 500                       | 80,0-86,0<br>(77,0-89,0)      |                              | 18,0-24,0<br>(15,0-27,0)      |                   | 7,7+0,2<br>7,2+0,3 |
|   |                             |   |                           |                               |                              |                               |                   |                    |

Checking values in brackets

\* 1 mm less control rod travel than col. 2

WPP 001/4 RVI 9,8 a 2

1. Edition

RO 750 PA 595-1 PES 6 P 120 A 320 RS 419-1 Komb.-Nr. 0 402 046 232 Values only apply to test nozzle-and-holder assembly 1 688 901 019 and fuel-injection test tubing 1 680 750 067

supersedes... company RVI MIDS 062045 engine 130 kW

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings
2,8-2,9
Port closing at prestroke (2,75-2,95)

mm (from BDCRW = 9.0-12.0 mm

| 13,3+0,1 |         | 0,5(0,9)        |  | 7 |
|----------|---------|-----------------|--|---|
| 3,0-0,0  | 1,7-2,3 | 0,6(1,2)        |  |   |
|          |         |                 |  |   |
| _        |         | 5,8-6,0 1,7-2,3 |  |   |

Adjust the fuel delivery from each outlet according to the values in

**B. Governor Settings** 

| Checking of slider PRG check Control rod travel rev/min | ① | Full-load s<br>Setting po<br>rev/min | • | •                  | rev/min                     | tdle spec<br>Setting p<br>rev/min | coint<br>Control<br>  rad travel | Test spe | cifications Control red travel mm | Torque o | Control rod (3) |
|---|---|--------------------------------------|---|--------------------|-----------------------------|-----------------------------------|----------------------------------|----------|-----------------------------------|----------|-----------------|
|   |   | •                                    | - | 12,3<br>4,0<br>900 | 750-755<br>787-800<br>0-1,0 | •                                 | •                                | •        | -                                 | •        | •               |

Torque-control travel on flyweight assembly dimension a =

Speed regulation: At

750-755 min-1

1 mm less control rod travel

## C. Settings for Fuel Injection Pump with Fitted Governor

|         | Silvery on control lever on 40°C (104°F) | Control rod stop | Fuel deliv   | ery characteristics                 | Starting for | Contra  |
|---------|--|------------------|--------------|-------------------------------------|--------------|---|
| rev/min | cm <sup>3</sup> /-1000 strokes<br>2      | rev/min<br>3     | rev/min<br>4 | cm <sup>3</sup> /-1000 strokes<br>5 | rev/min<br>6 | red travel<br>cm <sup>3</sup> /1000 strokes:/ mm<br>7 |
| 700     | 246,0-248,0<br>(243,0-251,0)             | •                | -            | -                                   | 100          | 160,0-180,0<br>(156,0-184,0)                          |

Checking values in brackets

5.84

BOSCH

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2

## Test Specifications Fuel Injection Pumps 2 and Governors

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WPP 001/4 MB 11,4 h

5. Edition

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PES 6 P 110 A 820 LS 422

RQ 300/1100 PA 327-1

Komb.-Nr. 0 402 046 218 0 402 046 239 supersede7.83
Daimler-Benz
company OM 407
engine: 147 kW

oi: 180 4113

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

### A. Fuel Injection Pump Settings

Port closing at prestroke

(2,95-3,15)

mm (from BDC)

| Rotational speed rev/min | Control rod<br>travel<br>mm<br>2 | Fuel delivery<br>cm <sup>3</sup> /100 strokes<br>3 | Difference<br>cm <sup>3</sup> /<br>100 strokes<br>4 | Control rod<br>travel<br>mm<br>2 | Fuel delivery  cm <sup>3</sup> /100 strokes 3 | Spring pre-tensioning<br>(torque-control valve)<br>mm<br>6 |
|--------------------------|----------------------------------|--|---|----------------------------------|---|--|
| 1100                     | 10.6+0.1                         | 10.3-10.5  | 0,4(0,8)  | :                                |   |  |
| 300                      | 8,2-8,4                          | 1,4-2,0  | 0,4(0,7)  |                                  |   |  |
|                          |                                  |  |   |                                  |   |  |
|                          |                                  |  |   |                                  |   |  |

Adjust the fuel delivery from each outlet according to the values in

### **B.** Governor Settings

| Checkin | g of slider    | Full-load s  | •    | -                                 |                                 | idle spec    | -                                 |                | cifications (5)                   | Torque o | (3)                               |
|---------|----------------|--------------|------|-----------------------------------|---------------------------------|--------------|-----------------------------------|----------------|-----------------------------------|----------|-----------------------------------|
| rev/min | travel mm      | rev/min<br>3 |      | Central<br>rad travel<br>snm<br>5 | rev/min                         | rev/min<br>7 | Control<br>red travel<br>rmm<br>8 | rev/min<br>9   | Control rod<br>travel<br>mm<br>10 | rev/min  | Control rod<br>travel<br>mm<br>12 |
| 600     | 13,0-14,0      | 600          | 13,5 | 9,6<br>4,0<br>1350                | 1145-1160<br>1175-1205<br>0-1,5 | 300          |                                   | 300            | nin.7,5<br>5,0-6,2<br>90=2,0      | •        | •                                 |
|         | control travel | <u> </u>     |      |                                   |                                 | <u> </u>     | 11                                | 45 <b>-</b> 11 | 60 min 1                          |          | 1 mm less contro                  |

Torque-control travel on flyweight assembly dimension a =

mm

Speed regulation: At

1 mm less control rod travel

## C. Settings for Fuel Injection Pump with Fitted Governor

| governor     | control lever mp 40°C (104°F)  | Control rod stop | Fuel deliv   | ery characteristics                 | <u>3b</u> | Contral      |  |  |
|--------------|--------------------------------|------------------|--------------|-------------------------------------|-----------|--------------|--|--|
| rev/min<br>1 | cm <sup>3</sup> /-1000 strokes | rev/min          | rev/min<br>4 | cm <sup>3</sup> /-1000 strokes<br>5 |           | rev/min<br>6 | red travel<br>cm <sup>3</sup> /1000 strokes/ mm<br>7 |  |
| 1100         | 103,0-105,0<br>(100,0-108,0)   | 500              | 500          | 76,0-80,0<br>(73,0-83,0)            |           | 100          | 130,0-150,0<br>(126,0-154,0)                         |  |

Checking values in brackets

5.84

E15

BOSCH

Geschäftsbereich KH. Kundendienst. Kfz-Ausrüstung € 1980 by Robert Bosch GmbH, Postfach 50. D-7000 Stuttgart 1. Printed in the Federal Republic of Germany Imprimé en République Fédérale d'Allemagne par Robert Bosch GmbH **Testoil-ISO 4113** 

## **Test Specifications** Fuel Injection Pumps and Governors

WPP 001/4 MB 9,5 a 5. Edition

PES 5 P 110 A 820 LS 434 Komb.-Nr. 0 402 045 022 1 - 3 - 5 - 4 - 2

RQ 300/1100 PA 327-3

je 72 ± 0,5° (0,75°)

supersede19.83

Daimler-Benz OM 409 141 kW (192 PS)

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke

mm (from BDC) Zy1. 5

| 0.1 c.03m.g a. p. c.s |                       | (2,33,3,13)                  |             |                       |                  |  |
|-----------------------|-----------------------|------------------------------|-------------|-----------------------|------------------|--|
| Rotational speed      | Control rod<br>travel | Fuel delivery                | Difference  | Control rod<br>travel | Fuel delivery    | Spring pre-tensioning (torque-control valve) |
| rev/min               | mm                    | cm <sup>3</sup> /100 strokes | 100 strokes | mm                    | cm 1/100 strokes | mm   |
| 1                     | 2                     | 3                            | 4           | 2                     | 3                | 6  |
| 1100                  | 11.4+0.1              | 12.0 - 12.2                  | 0,4(0,8)    |                       |                  |  |
| 300                   | 8,0-8,                | 1,2- 1,8                     | 0,4(0,7)    |                       |                  |  |
|                       |                       |                              |             |                       |                  |  |
|                       | į                     |                              |             |                       |                  |  |
|                       | 1                     | 1                            |             | 1                     | ŀ                |  |

Adjust the fuel delivery from each outlet according to the values in

**B. Governor Settings** 

| Checkin | g of slider                 | Full-load  | speed re              | gulation  |                                   | Idle speed regulation |                       |            |                                      | Torque o | ontrol                      |
|---------|-----------------------------|------------|-----------------------|-----------|-----------------------------------|-----------------------|-----------------------|------------|--------------------------------------|----------|-----------------------------|
|         | Control rod<br>travel<br>mm | Setting po | Control<br>red travel | Test spec | cifications Control rod travet mm |                       | Control<br>rod travel | Test spe   | cifications Control rod travel mm 10 | rev/min  | Control rod<br>travel<br>mm |
| 600     | 13,8-14,6                   | 600        | 14,2                  | 10,5      | 1145-1160<br>1175-1205            |                       | 7,1                   | 100<br>300 | min.10,0<br>8,0-8,2                  | -        | . •                         |
|         | _                           |            |                       |           |                                   |                       |                       | 375        | 415=2,0                              |          |                             |

Torque control travel on flyweight assembly dimension a

Speed regulation A1145 - 1160 min-1

1 mm less control

## C. Settings for Fuel Injection Pump with Fitted Governor

|              | elivery on<br>control lever<br>np 40°C (104°F) | Control rod stop | Fuel deliv   | ery characteristics            | Starting ( | uel delivery                   |
|--------------|--|------------------|--------------|--------------------------------|------------|--------------------------------|
| rev/min<br>1 | cm <sup>1</sup> /-1000 strokes                 | rev/min          | rev/min<br>4 | cm <sup>4</sup> /-1000 strokes | rev/min    | cm³/100 strokes<br>7           |
| 1100         | 120.0 - 122,0<br>(117,0 - 125,0)               | -                | 600          | 102,0 - 106,0 (99,0 - 109,0)   |            | 130,0 - 150,0<br>(126,0-154,0) |
|              |  |                  |              |                                |            |                                |

Checking values in brackets

5.84

Geschaftsbereich KH. Kundendienst. Kfz-Ausrustung. 1980 by Robert Bosch GmbH, Postfach 50, D-7000 Stuttgart 1. Printed in the Federal Republic of Germany Imprimé en République Fédérale d'Allemagne par Robert Bosch GmbH.

## **Test Specifications** Fuel Injection Pumps (1A) and Governors

WPP 001/4 MB 9,5 a 5

3. Edition

En

PES 5 P 110 A 820 LS 434

RSV 350-1100 P0/485

1 - 3 - 5 - 4 - 2 je  $72^{\circ}$   $\stackrel{+}{=}$  0,5° ( $\stackrel{+}{=}$  0,75°) Komb.-Nr. 0 402 075 002

supersedQ .83

company Daimler-Benz

OM 409

137 kW (186 PS)

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

## A. Fuel Injection Pump Settings

Port closing at prestroke

3.0 - 3.1(2,95-3,15)

mm (from BDC)

| Rotational<br>speed<br>rev/min<br>t | Control rod travel | Fuel delivery<br>cm*/100 strokes<br>3 | Difference<br>cm <sup>-/</sup><br>100 strokes<br>4 | Control rod<br>travel<br>mm<br>2 | Fuel delivery<br>cm/100 strokes | Spring pre-tensioning<br>(torque-control valve)<br>mm<br>6 |
|-------------------------------------|--------------------|---------------------------------------|--|----------------------------------|---------------------------------|--|
| 1080                                | 11,4+0,1           | 12,0-12,2                             | 0,4 (0,8)  |                                  |                                 |  |
| 350                                 | 7,7-7,9            | 1,1-1,7                               | 0,4 (0,7)  |                                  |                                 |  |
|                                     |                    |                                       |  |                                  |                                 |  |
|                                     |                    |                                       |  |                                  |                                 | <u> </u>   |

Adjust the fuel delivery from each outlet according to the values in

### **B. Governor Settings**

| Degree of<br>deflection<br>of control<br>lever | r rated speed<br>Control rod<br>travet<br>mm | rev/min<br>Control rod<br>travel<br>mm rev/min | Interme | ediate rate | ed speed | Control-<br>lever<br>deflection<br>in degrees<br>7 | Lower<br>rev/min<br>8 | rated speed<br>Control rod<br>travel<br>mm | 3 To | rque control<br> Control rod<br> travel<br> mm |
|--|--|--|---------|-------------|----------|--|-----------------------|--|------|--|
| loose  | 800<br>x =                                   | 0,3-1,0<br>2,25                                | -       | -           | -        | ca.27  | 350<br>350            | 7.8<br>7.7-7.9<br>30= 2.0                  | -    | -  |
| ca. 48   | 10,4<br>4,0<br>1300                          | 1120-1130<br>1190-1220<br>0,3-1,7              |         |             |          |  | 470-5                 | ••<br>••                                   |      |  |

Set idle-speed auxiliary spring at 2 mm control-rod travel.

## C. Settings for Fuel Injection Pump with Fitted Governor

|                             | ill load stop                             | Rotational speed limitat    |              | el delivery<br>paracteristics      | Starting tidle | luel delivery 5               | Idle stop                  |              |  |
|-----------------------------|---|-----------------------------|--------------|------------------------------------|----------------|-------------------------------|----------------------------|--------------|--|
| Test oil ti<br>rev/min<br>1 | emp 40°C (104°F)<br>cm*/1000 strokes<br>2 | Note changed to 1 rev/min 3 | rev/min<br>4 | cm <sup>3</sup> /1000 strokes<br>5 | rev/min        | cm <sup>1</sup> /1000 strokes | ′ <b>&amp;</b> v/min<br>∮8 | travel<br>mm |  |
| 1080                        | 120,0-122,0<br>(117,0-125,0)              | 1120-1130*                  | -            | •                                  | 100            | 130,0-150,<br>(126,0-45       | 0 -<br>.o)                 | -            |  |
|                             |   |                             |              |                                    |                |                               |                            |              |  |

Checking values in brackets

\* r mm less control rod travel than col. 2

Geschaftsbereich KM. Kundendienst. Kfz-Ausrustung. < 1980 by Robert Bosch GmbH, Postfach 50. D-7000 Stuttgart 1. Printed in the Federal F-apublic of Germany Imprimé en République Fédérale d'Allemagne par Robert Bosch GmbH.

## Test Specifications Fuel Injection Pumps ① and Governors

WPP 001/4 RVI 9,8 b 2

En

PE 6 P 120 A 320 RS 438-1 RQV 275-1200 PA648 Komb.-Nr. 0 401 846 497 Values only apply to test nozzle-and-holder assembly 1 688 901 019 and fuel-injection test tubing 1 680 750 067

supersedes – compaRV I engineMIDS 062030 150 kW

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

ram (from BDC) Port closing at prestroke (3,45-3,65)Control rod Spring pre-tensioning (torque-control valve) Fuel delivery Difference **Fuel delivery** Control rod Rotational speed cm<sup>3</sup>/ 100 strokes cm<sup>3</sup>/100 strokes щm cm<sup>3</sup>/100 strokes rev/min mm 0,5 (0,9 13.3 - 13.51200 11,2+0,1 0,8 (1,2) 1.5 - 2.1275 7.4-7.6

Adjust the fuel delivery from each outlet according to the values in

**B. Governor Settings** 

eston-

| deflection of control |                     | Control rod (ta travel mm rev/min (2/2) | of control | rated sp<br>rev/min<br>5 | Control rod<br>travel<br>mm 4 | Lower rated<br>Degree of<br>deflection<br>of control<br>lever<br>7 | speed<br>rev/min<br>8 | Control rod<br>travel<br>mm 3 | Stiding s<br>rev/min<br>10 | mm                        |
|-----------------------|---------------------|---|------------|--------------------------|-------------------------------|--|-----------------------|-------------------------------|----------------------------|---------------------------|
| max.                  | 1230                | 15,2-17,8                               | -          | -                        | -                             | ca.12  | 200                   | min.9,0                       | 250                        | 0 - 0,8                   |
| ca. 65                | 10,2<br>4,0<br>1500 |   |            |                          |                               | 275-360<br>③   | 275                   | 5,9-6,1                       |                            | 4,7-5,0<br>6,1-6,3<br>8,3 |

Torque control travel a =

mm

## C. Settings for Fuel Injection Pump with Fitted Governor

| Full-load de<br>Control-roo<br>Test oil terr |                  | Rotational-speed 20 limitation intermediate speed | Fuel deliv  | ery characteristics (5a)      | Starting<br>Idle<br>switchir |                               | Torque-<br>travel | Control 5 Control rod |
|--|------------------|---|-------------|-------------------------------|------------------------------|-------------------------------|-------------------|-----------------------|
| rev/min                                      | cm³/1000 strokes | rev/min 🐠   | rev/min     | cm <sup>3</sup> /1000 strokes | revimin                      | cm <sup>3</sup> /1000 strokes | rev/min           |                       |
| 1  | 2                | 3   | 4           | 5                             | 6                            | 7                             | 8                 | 9                     |
| 1200   | 133,0-135,0      | 12551265*   | <b>75</b> 0 | 116,0-122,0                   | 100                          | 180,0-200,0                   | -                 | -                     |
|  | (130,0-138,0     | )   |             | (113,0-125,0                  | )                            | (176,0-204,0                  | )                 |                       |
|  |                  |   |             |                               |                              |                               |                   |                       |

Checking values in brackets

\* 1 mm less control rod travel than col. 2

## **Test Specifications** Fuel Injection Pumps (A) and Governors

WPP 001/4 DAF 11,6 u

4. Edition

PE 6 P 110 A 720 RS 441

Komb.-Nr. 0 401 876 252

RSV 250-1200 P 5/493

supersedes 7.83 DAF **DHS 825** engine

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings 2,8-2,9
Part closing at prestroke (2,75-2,95) mm

mm (from BDC) RW=9,0-12,0 mm

| Rotational<br>speed<br>rev/min<br>t | Control rod<br>travel<br>mm 2 | Fuel delivery<br>cm 1/100 strokes<br>3 | Difference<br>cm·/<br>100 strokes<br>4 | Control rod<br>travel<br>mm<br>2 | Fuel delivery<br>cm:/100 strokes<br>3 | Spring pre tensioning (torque-contre! valve) mm |
|-------------------------------------|-------------------------------|--|--|----------------------------------|---------------------------------------|---|
| 1000                                | 12,2+0,1                      | 13,7-14,0                              | 0,4(0,75)                              |                                  |                                       |   |
| 250                                 | 5,0-5,2                       | 0,7-1,2                                | 0,45(0,75                              |                                  |                                       |   |
|                                     |                               |  |  |                                  |                                       |   |
|                                     |                               |  |  |                                  |                                       |   |

### **B.** Governor Settings

|               | rated speed         | rev/min                           | Interme | diate rated | speed | <b>①</b>                 |                | rated speed       | 1 3 /   | rque control<br> Control rad |
|---------------|---------------------|-----------------------------------|---------|-------------|-------|--------------------------|----------------|-------------------|---------|------------------------------|
| I IN GOINGELL | travel<br>mm        | travel<br>mm rev/min              |         |             |       | Control lever deflection | rev/min        | travel<br>mm      | rev/min | travel<br>mm                 |
| lever<br>1    | 2                   | 3                                 | 4       | 5           | 6     | in degrees<br>7          | 8              | 9                 | 10      | 11                           |
| 10050         | 800                 | 0,3-1,0                           | -       | -           | -     | ca. 24                   | 250            | 4,6               | 400     | 12,4-12,5                    |
| loose         | χ =                 | 5,0                               |         |             |       |                          | 250<br>525-5   | 5,0~5,2<br>35=2,0 | 300     | 12,6-13,1                    |
| ca. 58        | 11,2<br>4,0<br>1500 | 1240-1250<br>1330-1360<br>0,3-1,7 |         |             |       |                          | <i>323</i> -30 | 55-29.5           |         |                              |

The numbers denote the sequence of the tests

## C. Settings for Fuel Injection Pump with Fitted Governor

| 2b) Fu      | ill load stop                             | 6 Rotational-<br>speed limitat |            | uel delivery<br>paracteristics     | Starting f | (a) Idle slop                                      |             |                                  |
|-------------|---|--------------------------------|------------|------------------------------------|------------|--|-------------|----------------------------------|
| rev/min     | emp 40 C (104 F)<br>cm·/1000 strokes<br>2 | Note changed to ) rev/min 3    | rev/min    | cm <sup>-/</sup> 1000 strokes<br>5 | rev/min    | cm v 1000 strokes<br>7                             | rev/min     | Control rad<br>travel<br>mm<br>9 |
| LDA<br>1000 | 0,7 bar<br>137,0-140,0<br>134,5-142,5)    | 1240-1250*                     | LDA<br>600 | 0 bar<br>91,5-94,5<br>(89,0-97,0)  | 100        | 245,0-285<br>(241,0-285<br>=19,5-<br>21,0 mm<br>RW | ,0 -<br>,0) | -                                |
|             |   |                                |            |                                    | 250        | 7,0-12,<br>(4,5-14,                                | )<br>5)     |                                  |

Checking values in brackets

\* 1 mm less control rod travel than cot 2

E19

|                              |                    |                      | difference                                       |
|------------------------------|--------------------|----------------------|--|
|                              | Gauge pressure bar | Gauge pressure = bar | mm (1)   |
| PE 6 PRS 441<br>+ RSVP 5/493 | 0,70               | 0<br>0,36<br>0,27    | 12,2-12,3<br>10,1-10,2<br>11,7-11,8<br>10,8-11,2 |
|                              |                    |                      |  |

\*lotes

(1) when n

rev/min and gauge pressure :

bar ( \* maximum full-load control rod travel)

## Test Specifications Fuel Injection Pumps 2 and Governors

WPP 001/4 DAF 11,6 u 1

2. Edition

PE 6 P 110 A 720 RS 441 Komb.-Nr. 0 401 846 461 RQ 225/1200 PA 617

supersede1.82 compan DAF engine DHS 825

Testoil-iSO 4113

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

## A. Fuel Injection Pump Settings

Port closing at prestroke

mm (from BDQW=9.0 - 12.0 mm

| Rotational speed rev/min | Control rod<br>travel<br>mm | Fuel delivery  cm <sup>3</sup> /100 strokes 3 | Difference<br>cm <sup>3</sup> /<br>100 strokes<br>4 | Control rod<br>travel<br>mm<br>2 | Fuel delivery  cm <sup>3</sup> /100 strokes 3 | spring pre-tensioning (torque-control valve) mm 6 |
|--------------------------|-----------------------------|---|---|----------------------------------|---|---|
| 1000                     | 12,2+0,1                    | 13,7-14,0                                     | 0,4 (0,75   |                                  |   |   |
| 225                      | 5,5-5,7                     | 1,0 -1,5                                      | 0,45(0,75   |                                  |   |   |
|                          |                             |   |   |                                  |   |   |
|                          |                             |   |   |                                  |   |   |

Adjust the fuel delivery from each outlet according to the values in

### **B.** Governor Settings

| PRG che | Control rod | D |     | int<br>Control | Test spec<br>Control<br>rad travel | rev/min                        | 1  | rev/min | oint<br>Centrel<br>rad travel | Test spe | cifications 5 Control rod       | Control rod (3) travel mm |
|---------|-------------|---|-----|----------------|------------------------------------|--------------------------------|----|---------|-------------------------------|----------|---------------------------------|---------------------------|
| 650     | 15,6-16,    | 4 | 650 | 16,0           | 11,2<br>4,0<br>1450                | 1235-125<br>1310-134<br>0 - 1, | 10 | 225     | 5,3                           |          | min. 6.7<br>5,5-5.7<br>10 = 2,0 | 12,2-12,3<br>12,1-12,3    |

Torgue-control travel on flyweight assembly dimension a =

Speed regulation A1235-1250 min-1

1 mm less control rod travel

## C. Settings for Fuel Injection Pump with Fitted Governor

| governor     | ull-load delivery on overnor control lever est oil temp. 40°C (104°F) |  | Control rod stop | 3 | Fuel delivery characteristics (3) |                                  |  | Confr   |   |  |
|--------------|---|--|------------------|---|-----------------------------------|----------------------------------|--|---------|---|--|
| rev/min<br>1 | cm <sup>3</sup> /-1000 strokes<br>2                                   |  | rev/min<br>3     |   | rev/min<br>4                      | cm³/-1000 strokes<br>5           |  | rev/min | red travel<br>cm <sup>3</sup> /1000 strokes:/ mm<br>7 |  |
| LDA<br>1000  | 0.7 bar<br>136,5-139,5<br>(134,0-142,0)                               |  | -                |   | 600                               | 0 bar<br>91,5-94,5<br>89,0-97,0) |  | (       | 245,0-285,0<br>241,0-289,0)<br>=19,5-21,0 mm<br>RW    |  |

Checking values in brackets

5.84

**BOSCH** 

DAF 11,6 u 1 - 2

Test at n :

600

rev/min decreasing pressure - in bar gauge pressure

| Pump/governor | Setting          | Measurement          | diminution Control rod travel- difference |
|---------------|------------------|----------------------|---|
|               | Gauge pressure = | bar Gauge pressure = | bar mm (1) .                              |
| PE6PRS441     | 0,36             |                      | 11,7 - 11,8                               |
| + RQPA617     |                  | 0,70                 | 12,2 - 12,3                               |
|               |                  | 0                    | 10,1 - 10,2                               |
|               |                  | 0,29                 | 10,8 - 11,2                               |
|               |                  |                      |   |
|               |                  | •                    |   |
| 41410         |                  |                      |   |

tintes

(1) when n

rev/min and gauge pressure =

bar (= maximum full-load control rod travel)

Test Specifications
Fuel Injection Pumps ②
and Governors

40

WPP 001/4 MB 11,4 1 5

3. Edition

En

PES 6 P 110 A 820 LS 442 Komb.-Nr. 0 402 046 234 RQ 300/1100 PA 327-5

supersedes 03 Daimler-Benz companyOM 407 engine 162 kW

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump, Settings

Port closing at prestroke

(3.15-3.35)

mm (from BDOZyl. 6

| Rotational speed rev/min 1 | Control rod<br>travel<br>mm<br>2 | Fuel delivery<br>cm <sup>3</sup> /100 strokes<br>3 | Difference<br>cm³/<br>100 strokes<br>4 | Control rod<br>travel<br>mm<br>2 | Füël delivery<br>cm <sup>3</sup> /100 strokes<br>3 | Spring pre-tensioning<br>(torque-control valve)<br>mm<br>6 |
|----------------------------|----------------------------------|--|--|----------------------------------|--|--|
| 1100<br>300                | 11,0±0,<br>8,0=8,2               |  | 0,4(0,8)                               |                                  |  |  |
|                            |                                  |  |  |                                  |  |  |

Adjust the fuel delivery from each outlet according to the values in

### **B.** Governor Settings

| Checkin<br>PRG che | g of slider                 | Full-load s<br>Setting po | ,                                 | •                                 |                                 | Idle spec | -                                 |                    | cifications (5)                 | Torque o      | control (3)          |
|--------------------|-----------------------------|---------------------------|-----------------------------------|-----------------------------------|---------------------------------|-----------|-----------------------------------|--------------------|---------------------------------|---------------|----------------------|
| rev/min            | Control rod<br>travel<br>mm |                           | Control<br>rod travel<br>rmm<br>4 | Centrel<br>red travel<br>rnm<br>5 | rev/min                         |           | Control<br>red travel<br>rnm<br>B | rev/min<br>9       | Control rod<br>travel           | rev/min<br>11 | Control rod (travel) |
| 600                | 13,0-14,0                   | 600                       | 13,5                              | 10,0<br>4,0<br>1300               | 1145-1160<br>1180-1210<br>0-1,0 |           | 8,1                               | 100<br>300<br>375- | min. 9,5<br>8,0-8,2<br>115= 2,0 | •             |                      |

Torque-control travel on flyweight assembly dimension a =

mm

Speed regulation At

1 mm less control rod travel

## C. Settings for Fuel Injection Pump with Fitted Governor

|              | elivery on control lever on 40°C (104°F)      | Control rod stop 3a | Fuel delive | ery characteristics (3b)            | Starting for | Control   |
|--------------|---|---------------------|-------------|-------------------------------------|--------------|---|
| rev/min<br>1 | cm³/~1000 strokes                             | rev/min<br>3        | rev/min     | cm <sup>3</sup> /-1000 strokes<br>5 | rev/min<br>6 | red travel<br>cm <sup>3</sup> /1000 strokes / mm<br>7 |
| 1100         | 116,0 - 11 <sup>8</sup> ,0<br>(113,5 - 120,5) | 500                 | 600         | 93,0 - 97,0<br>(90,0 - 100,0)       | 100          | 130,0 - 150,0<br>(126,0-154,0)                        |
|              |   |                     |             |                                     |              |   |

Checking values in brackets

7,84

BOSCH

## Test Specifications Fuel Injection Pumps ① and Governors

WPP 001/4 MB 11,4 L3

3. Edition

Testoil-ISO 4113

PES 6 P 110 A 820 LS 442

Komb.-Nr. 0 402 046 233 0 402 046 301 ROV 300-1100 PA 594-3

supersedes Daimler-Benz company engine 0M 407 162 kW (220 PS)

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

3,2-3,3 Port closing at prestroke (3,15-3,35) mm (from BDC) ZV1. 6

| Rotational speed rev/min | Control rod<br>travel<br>mm<br>2 | Fuel delivery<br>cm <sup>3</sup> /100 strokes<br>3 | Difference<br>cm <sup>3</sup> /<br>100 strokes<br>4 | Control rod<br>travel<br>mm<br>2 | Fuel delivery<br>cm <sup>3</sup> /100 strokes<br>3 | Spring pre-tensioning<br>(torque-control valve)<br>mm<br>6 |
|--------------------------|----------------------------------|--|---|----------------------------------|--|--|
| 1100<br>300              | 11,0+0,1<br>8,0-8,2              |  | 0,4(0,8)<br>0,4(0,7)                                |                                  |  |  |

Adjust the fuel delivery from each outlet according to the values in

## **B.** Governor Settings

| Upper rated :                   |                    |                                   | Intermediat | e rated sp   | 4                     | Lower rated                     | speed        | la                    | Sliding s     | leeve travel       |
|---------------------------------|--------------------|-----------------------------------|-------------|--------------|-----------------------|---------------------------------|--------------|-----------------------|---------------|--------------------|
| Degree of deflection of control | Control rod travel | Control rod te                    | of control  |              | Control rod<br>travel | Degree of deflection of control |              | Control rod<br>travel |               |                    |
| lever<br>1                      | mm<br>2            | rev/min (2s                       | lever<br>4  | rev/min<br>5 | mm (4)<br>6           | lever<br>7                      | rev/min<br>8 | mm (3)<br>9           | rev/min<br>10 | mm<br>11           |
| max.                            | 1100               | 15,2-17,8                         | -           | -            | -                     | ca.32                           | 100<br>300   | min. 9,0<br>7,3-7,5   | 250<br>530    | 1,0-1,3<br>3,9-4,2 |
| ca. 60                          |                    | 1140-1150<br>1175-1205<br>0 - 1,0 |             |              |                       | 320-459                         |              |                       | 820<br>1100   | 5,5-5,8<br>8,1     |
|                                 |                    |                                   |             |              |                       | <b>3</b> a                      |              |                       |               |                    |

Torque control travel a = m

## C. Settings for Fuel Injection Pump with Fitted Governor

| Full-load d<br>Control-ro<br>Test oil ten |                               | Rotational-speed 2b<br>Irmitation<br>Intermediate speed | Fuel delic<br>high idle s | rery characteristics 5a peed 5b | Starting<br>Idle<br>switchli | . •                            | Torque-<br>travel | Control rod  |
|---|-------------------------------|---|---------------------------|---------------------------------|------------------------------|--------------------------------|-------------------|--------------|
| rev/min                                   | cm <sup>3</sup> /1000 strokes | rev/min 40  | rev/min                   | cm <sup>3</sup> /1000 strokes   | rev/min                      | cm <sup>3</sup> /1000 strokes  | rev/min           | travel<br>mm |
| 1   | 2                             | 3   | 4                         | 5                               | 6                            | 7                              | 8                 | 9            |
| 1100                                      | 116,0-118,0<br>(113,0-121,0)  | 1140-1150*  | 600                       | 93,0- 97,0<br>90,0-100,0)       | 100                          | 130, 0-150, 0<br>126, 0-154, 0 | -                 | -            |

Checking values in brackets

\* 1 mm less control rod travel than col. 2

# Test Specifications Fuel Injection Pumps (A) and Governors

40

WPP 001/4 MB 11,4 1 6

2. Edition

En

PES 6 P 110 A 820 LS 442-1

RSV 350-1100 P 0/485

Komb.-Nr. 0 402 076 053

supersede 1.83
company Daimler-Benz
OM 407

engine 177 kW (241 PS)

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

### A. Fuel Injection Pump Settings

Port closing at prestroke

Testoil-ISO 4113

3,2 - 3,3 (3,15-3,35)

mm (from BDC)

| Rotational speed | Control rod<br>travel | Fuel delivery  | Difference  | Control rod<br>travel | Fuel delivery    | Spring pre-tensioning (torque-control valve) |
|------------------|-----------------------|----------------|-------------|-----------------------|------------------|--|
| rev/min          | mm <b>(2)</b>         | cm/100 strokes | 100 strokes | mm                    | cm //100 strokes | mm   |
| 1                | 2                     | 3              | 4           | 2                     | 3                | 6  |
| 1100             | 11,7+0,1              | 12,5-12,7      | 0,4 (0,8)   |                       |                  |  |
| 350              | 7,8-8,0               | 1,4-2,0        | 0,4 (0,7)   |                       |                  |  |
|                  |                       | •              |             |                       |                  |  |
|                  | 1                     |                |             |                       |                  |  |
|                  | <b>1</b>              |                |             |                       |                  |  |

Adjust the fuel delivery from each outlet according to the values in

### **B. Governor Settings**

| Degree of<br>deflection<br>of control<br>lever | r rated speed<br>Control rod<br>travel<br>mm |                                   | Intermediate rated speed 4 5 6 |   | Control-<br>lever<br>deflection<br>in degrees<br>7 | Lower<br>rev/min<br>8 | rated speed<br>Control rod<br>travel<br>mm | I (                       | rque controt<br> Controt rod<br>travet<br> mm<br>  11 |   |
|--|--|-----------------------------------|--------------------------------|---|--|-----------------------|--|---------------------------|---|---|
| loose  | 800<br>×                                     | 0,3-1,0<br>= 3,0                  | -                              | - | -  |                       | 350<br>350                                 | 7,9<br>7,8-8,0<br>5 = 2,0 | -   | - |
| ca .51   | 10,7<br>4,0<br>1250                          | 1140-1150<br>1220-1250<br>0,3-1,0 |                                |   |  |                       | 435-49                                     | 5 = 2,0                   |   |   |

The numbers denote the sequence of the tests

## C. Settings for Fuel Injection Pump with Fitted Governor

|             | ill load stop                         | 6 Rotational-<br>speed limitat |         | iel delivery<br>iaractenstics    | Starting f | uel delivery 5                | (4a) Idi     | e stop                      |
|-------------|---------------------------------------|--------------------------------|---------|----------------------------------|------------|-------------------------------|--------------|-----------------------------|
| Test oil to | emp. 40°C (104°F)<br>cm*/1000 strokes | Note changed to ) rev/min      | rev/min | cm <sup>3</sup> /1000 strokes    | rev/min    | cm <sup>3</sup> /1000 strokes | rev/min<br>8 | Control rod<br>travel<br>mm |
|             | 125,0-127,0<br>(122,0-130,0)          | 1140-1150*                     | 600     | 11 1,0-115 ,0<br>(108 ,0-118 ,0) | 100 (      | 140,0-160<br>136,0-164        | ,0 -<br>o)   | -                           |
|             |                                       |                                |         |                                  |            |                               |              |                             |

Checking values in brackets

\* 1 mm less control rod travel than col. 2

**BOSCH** 

Geschaftsbereich KH. Kundendienst. Kfz-Ausrustung v. 1980 by Robert Bosch GmbH. Postfach 50. D-7000 Stuttgart 1. Printed in the Federal Republic of Germany Imprimé en République Fédérale d'Allemagne par Robert Bosch GmbH.

# Test Specifications Fuel Injection Pumps (A) and Governors

40

WPP 001/4 DAF 8,3 o 2. Edition

En

PE 6 P 100 A 720 RS 447

Komb.-Nr. 0 401 876 260

RSV 250-1200 P5/493

supersedes 6.83

company DAF

engine DHT 825

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

## A. Fuel Injection Pump Settings

Port closing at prestroke

3,2 - 3,3 (3,15-3,35)

mm (from BDC)

| Rotational speed | Control rod<br>travel | Fuel delivery                | Difference                       | Control rod travel | Fuel delivery   | Spring pre-tensioning (torque-control valve) |
|------------------|-----------------------|------------------------------|----------------------------------|--------------------|-----------------|--|
| rev/min          | mm <b>2</b>           | cm <sup>1</sup> /100 strokes | cm <sup>1</sup> /<br>100 strokes | mm<br>2            | cm /100 strokes | mm<br>6                                      |
| 1000             | 11,4+0,1              | 11,9-12,1                    | 0,35(0,6)                        |                    |                 |  |
| 250              | 5,3-5,5               | 0,7-1,1                      | 0,3(0,5)                         |                    |                 |  |
|                  |                       |                              |                                  |                    |                 |  |
|                  |                       |                              |                                  |                    |                 |  |

Adjust the fuel delivery from each outlet according to the values in [

### **B. Governor Settings**

| 11 1  | r rated speed<br>Control rod<br>travel<br>mm |                                   | Intermediate rated speed |   |   | Control-<br>lever<br>deflection<br>in degrees | rev/min    | rated speed<br>Control rod<br>travel<br>mm | rev/min    | rque control<br>  Control rod<br>  travel<br>  mm |
|-------|--|-----------------------------------|--------------------------|---|---|---|------------|--|------------|---|
| loose | 2<br>800<br>x =                              | 0,3-1,0<br>5,0                    | -                        | 5 | - | ca.24   | 250<br>100 | 9<br>4,9<br>min. 7,0                       | 400<br>300 |   |
| ca.58 | 10,4<br>4,0<br>1530                          | 1240-1250<br>1325-1355<br>0,3-1,7 |                          |   |   |   | 250        | 5,3 - 5,5<br>0 = 2,0                       |            |   |

The numbers denote the sequence of the tests

### C. Settings for Fuel Injection Pump with Fitted Governor.

|             | ill load stop                           | Rotational speed limital 3a Fuel delivery characteristics |              |                                    | Starting I | uel delivery 5   | 4a Idle stop |                             |
|-------------|---|---|--------------|------------------------------------|------------|--|--------------|-----------------------------|
| revimin     | cm //1000 strokes                       | Note changed to ) rev/min 3                               | rev/min<br>4 | cm <sup>1</sup> /1000 strokes<br>5 | rev/min    | cm //1000 strokes<br>7                                       | rev/min<br>8 | Control rod<br>travel<br>mm |
| LDA<br>1000 | 0,7 bar<br>118,5-120,5<br>(116,5-122,5) | 1240 - 1250*  | LDA<br>600   | 0 bar<br>92,5-96,5<br>(90,0-99,0)  | 100<br>250 | 210,0-230<br>(206,0-23 <sup>1</sup><br>7,0-11,0<br>(4,5-13,5 |              | -                           |

Checking values in brackets

\* 1 mm less control rod travel than col 2

DAF 8,3 o

- 2 -

Testatn -

600

rev/min decreasing pressure - in bar gauge pressure

| Pump/governor | Setting              | Measurement          | diminution<br>Control rod travel-<br>difference |
|---------------|----------------------|----------------------|---|
|               | Gauge pressure = bar | Gauge pressure = bar | mm (1) .  |
| PE6PRS447     | 0,32                 |                      | 11,1 - 11,2                                     |
| + RSVP5/493   |                      | 0,70                 | 11,4 - 11,5                                     |
|               |                      | 0                    | 10,4 - 10,5                                     |
|               |                      | ũ,23                 | 10,5 - 10,9                                     |
|               |                      |                      |   |
| i<br>i<br>!   |                      |                      |   |
|               |                      |                      |   |
| 1             |                      |                      |   |

tiotes

: 1) when n

rev/min and gauge pressure =

bar ( - maximum full-load control rod travel)

# Test Specifications Fuel Injection Pumps ② and Governors

40

WPP 001/4 DAF 8,3 o 1 2. Edition

Εn

PE 6 P 100 A 720 RS 447 Komb.-Nr. 0 401 846 471

RQ 225/1200 PA 617

, ng 220, 1200

supersedes 3.83

company DAF

engine DHT 825

Testoil-ISO 4113

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

#### A. Fuel Injection Pump Settings

Port closing at prestroke 3,2 - 3,3 mm (from BDC)

| Rotational speed rev/min 1 | Control rod<br>travel<br>mm<br>2 | Fuel delivery  cm <sup>3</sup> /100 strokes 3 | Difference<br>cm <sup>3</sup> /<br>.100 strokes<br>4 | Control rod<br>travel<br>mm<br>2 | Fuel delivery  cm <sup>3</sup> /100 strokes 3 | Spring pre-tensioning<br>(torque-control valve)<br>mm<br>6 |
|----------------------------|----------------------------------|---|--|----------------------------------|---|--|
| 1000<br>225                | 11,4+0,1<br>5,3-5,5              | 11,9-12,1<br>1,0-1,4                          | 0, <b>罗(0,6)</b><br>0, <b>罗(0,</b> 55                |                                  |   |  |

Adjust the fuel delivery from each outlet according to the values in

#### **B.** Governor Settings

| PRG che | Control rod | Full-load s<br>Setting po<br>rev/min<br>3 | int  | • | rev/min                           | Idle spec<br>Setting p<br>rev/min<br>7 | coint<br>Centrel<br>red travel<br>rnm | Test spe | cifications 5<br>Control rod<br>travel<br>mm |              | Control rod (3)      |
|---------|-------------|---|------|---|-----------------------------------|--|---------------------------------------|----------|--|--------------|----------------------|
| 650     | 15,6-16,4   | 650                                       | 16,0 |   | 1235-1250<br>1305-1335<br>0 - 1,0 |  | 5,4                                   | 225      |  | 1000<br>1200 | 1,4-11,5<br>1,3-11,5 |

Torque-control travel on flyweight assembly dimension a

0 mm

Speed regulation: At

1 mm less control rod travel

## C. Settings for Fuel Injection Pump with Fitted Governor

| Full-load d<br>governor of<br>Test oil ter | elivery on<br>control lever<br>np. 40°C (104°F) | Control rod stop 3a | Fuel delivery characteristics |                                     |  | Starting f   | d Control  |
|--|---|---------------------|-------------------------------|-------------------------------------|--|--------------|--|
| rev/min                                    | cm <sup>3</sup> /-1000 strokes                  | rev/min<br>3        | rev/min<br>4                  | cm <sup>3</sup> /-1000 strokes<br>5 |  | rev/min<br>6 | cm <sup>3</sup> /1000 strokes:/ mm                   |
| LDA<br>1000                                | 0,7 bar<br>118,5-120,5<br>(116,5-122,5)         | -                   | LDA<br>600                    | 0 bar<br>92,5-96,5<br>(90,5-98,5)   |  | 100          | 210,0-230,0<br>(206,0-234,0)<br>= 19,5-21,0 mm<br>RW |
|  |   |                     |                               |                                     |  | 225          | 10,0-14,0<br>(7,5-16,5)                              |

Checking values in brackets

Test at n = rev/min decreasing pressure - in bar gauge pressure

DAF 8,3 0 1 - 2

| 600                        | mcreasing            |                      |  |
|----------------------------|----------------------|----------------------|--|
| Pump/governor              | Setting              | Measurement          | diminution Control rod travel- difference                |
|                            | Gauge pressure = bar | Gauge pressure = bar | mm (1)   |
| PE 6 PRS 447<br>+ RQPA 617 | 0,32                 | 0,70<br>0<br>0,27    | 11,1 - 11,2<br>11,4 - 11,5<br>10,4 - 10,5<br>10,5 - 10,9 |
|                            |                      | •                    |  |

Notes

(1) when n

rev/min and gauge pressure =

bar ( ~ maximum full-load control rod travel)

## **Test Specifications** Fuel Injection Pumps 1 and Governors

WPP 001/4 UNI 10,3 a 2. Edition

PE 6 P 110 A 720 RS 453

RQV 425-1000 PA 438-1

Komb.-Nr. 0 401 846 475

supersed % 83

company: Unic-IVECO engine: 8205-03-500

129 kW (175 PS)

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

## A. Fuel injection Pump Settings

| Port closing at pres Rotational speed rev/min | Control rod<br>travel<br>mm | fuel delivery  cm³/100 strokes | Difference<br>cm <sup>3</sup> /<br>100 strokes<br>4 | Control red<br>travel<br>mm<br>2 | Fuel delivery  cm <sup>3</sup> /100 strokes 3 | Spring pre-tensioning<br>(torque-control valve)<br>mm<br>6 |
|---|-----------------------------|--------------------------------|---|----------------------------------|---|--|
| 1000  | 10,0+0,1                    | 9,8-10,1                       | 0,4 (0,75   |                                  |   |  |
| 425   | 6,9-7,1                     | 2,1-2,7                        | の,45(0,方)   |                                  |   |  |
|   |                             |                                |   |                                  |   |  |
|   |                             |                                |   |                                  |   |  |

Adjust the fuel delivery from each outlet according to the values in

## **B. Governor Settings**

| Upper rated: Degree of deflection of control lever | rev/min<br>Control<br>rod travel<br>mm | Control rod ta travel mm rev/min 28          | Intermediate<br>Degree of<br>deflection<br>of control<br>lever |   | Control rod<br>travel<br>mm 4 | Lower rated Degree of deflection of control lever 7 | speed<br>rev/min<br>8 | Control rod<br>travel<br>mm 3 | Sliding 8<br>rev/min<br>10 | mm                                   |
|--|--|--|--|---|-------------------------------|---|-----------------------|-------------------------------|----------------------------|--------------------------------------|
| max.<br>ca.55                                      | 9,0                                    | 15,2-17,8<br>1040-1050<br>1150-1180<br>0-1,0 | -  | - | -                             | ca. 15<br>420-515<br>③                              | 425                   | min.8,5<br>6,9-7,1            | 400<br>600<br>800<br>1000  | 1,5-1,6<br>3,7-4,3<br>5,8-6,1<br>7,2 |

Torque control travel a =

## C. Settings for Fuel Injection Pump with Fitted Governor

| Full-load de<br>Control-roe<br>Test oil ten |                            | Rotational-speed (20) limitation intermediate speed | Fuel deliv | rery characteristics 50 paed 50 | Starting<br>Idle<br>awitchir |                             | Torque-<br>travel | Control cod |
|---|----------------------------|---|------------|---------------------------------|------------------------------|-----------------------------|-------------------|-------------|
| rev/min                                     | cm³/1000 strokes           | rev/min 40  | rev/min    | cm <sup>3</sup> /1000 strokes   | r <b>ev/m</b> in             | cm³/1000 strokes            | rev/min           | ww.         |
| 1   | 2                          | 3   | 4          | 5                               | 6                            | 7                           | 8                 | 9           |
| 1000  | 98,0-101,0<br>(95,5-103,5) | 1040-1050*  | -          | -                               | 100                          | 220,0-240,0<br>(216,0-244,0 | )-<br>)           | -           |
|   |                            |   |            |                                 |                              |                             |                   |             |

Checking values in brackets

\* 1 mm less control rod travel than col. 2

# Test Specifications Fuel Injection Pumps 2 and Governors

40

WPP 001/4 MAN 11,9 a 2. Edition

En

PE 6 P 120 A 720 LS 470 RQ 250/1100 PA 684 Komb.-Nr. 0 402 046 288 Values only apply to test nozzle-and-holder assembly 1 688 901 019 and fuel-injection test tubing 1 680 750 067

supersedes9.83 MAN company: D 2866 KF engine: 265 kW

Att test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke (2)

 $(1,8^{-2},9^{-2},9^{-2})$  mm (from BDC)Zy1. 6; RW = 9,0-12,0 mm

| Rotational speed rev/min | Control rad<br>travel<br>mm<br>2 | Fuel delivery<br>cm <sup>3</sup> /100 strokes<br>3 | Difference<br>cm³/<br>100 strokes | Control rod<br>travel<br>mm<br>2 | Fuel delivery<br>cm <sup>3</sup> /100 strokes<br>3 | Spring pre-tensioning (torque-control valve) mm 6 |
|--------------------------|----------------------------------|--|-----------------------------------|----------------------------------|--|---|
| 750                      | 12,5+0,1                         | 23,8-24,0  | 0,5(0,9)                          |                                  |  | •   |
| 250                      | 5,2-5,4                          | 1,2-1,8  | 0,8(1,2)                          |                                  |  |   |
|                          |                                  |  |                                   |                                  |  |   |
|                          |                                  |  |                                   | ,                                |  |   |

Adjust the fuel delivery from each outlet according to the values in

**B. Governor Settings** 

|                    | g of slider             | Full-load                   | *                           | _                            | cifications (4)                 | Idle spec | _                  |        | cifications (5)                | Torque o      | control 3  |
|--------------------|-------------------------|-----------------------------|-----------------------------|------------------------------|---------------------------------|-----------|--------------------|--------|--------------------------------|---------------|--|
| PRG che<br>rev/min | Control rod             | Setting por<br>rev/min<br>3 | Control<br>red travel<br>mm | Centrel<br>red travel<br>rmm | rev/min                         |           | Centrel red travel |        | Control roo<br>travel<br>mm    | rev/min<br>11 | travel   |
| 600<br>VH :        | 19,2-20,8<br>= max. 46° | 600                         | 20,0                        |                              | 1145-1160<br>1180-1210<br>0-1,0 |           | 5,3                | 250    | min.6,8<br>5,2-5,4<br>55 = 2,0 | 1100<br>935   | 12,5-12,6<br>11,3-11,4<br>12,4-12,6<br>11,7-12,0 |
| · · · · · · ·      | ontrol travel           | <u> </u>                    | 0.4                         | 5                            |                                 |           |                    | 145-11 | 60 min-1                       | <u> </u>      | 1 mm less conti                                  |

Torque-control travel on flyweight assembly dimension a =

0,45

Speed regulation: At

1 mm less control rod travel

C. Settings for Fuel Injection Pump with Fitted Governor

|                           | elivery on control lever pp 40°C (104°F)   | Control rod stop 3a | Fuel deliv               | ery characteristics  | Starting f | uel delivery                       |
|---------------------------|--|---------------------|--------------------------|--|------------|------------------------------------|
| rev/min<br>1              | cm³/-1000 strokes  | rev/min<br>3        | rev/min                  | cm <sup>3</sup> /-1000 strokes<br>5  | rev/min    | cm <sup>3</sup> /1000 strokes / mm |
| LDA<br>750<br>LDA<br>1100 | 1,0 bar<br>238,0-240,0<br>(235,0-243,0)<br>1,0 bar<br>213,0-219,0<br>(210,0-222,0) | •                   | LDA<br>650<br>LDA<br>500 | 1,0 bar<br>239,0-245,0<br>(236,0-248,0)<br>0 bar<br>139,0-141,0<br>(136,0-144,0) | 100        | 225,0-245,0<br>(221,0-249,0)       |

Checking values in brackets

7.84

BOSCH

MAN 11,9 a

- 2 -

Test at r. .

500

rev/min decreasing pressure - in bar gauge pressure

| 500                    |                      |                      |  |
|------------------------|----------------------|----------------------|--|
| Pump/governor          | Setting              | Measurement          | diminution<br>Control rod travel-<br>difference        |
|                        | Gauge pressure = bar | Gauge pressure = bar | mm (1)   |
| PE6PLS470<br>+ RQPA684 | 1,0                  | 0<br>0,40<br>0,24    | 12,5 - 12,6<br>9,3 - 9,4<br>11,1 - 11,2<br>10,2 - 10,6 |
|                        |                      | :                    |  |

Notes

(1) when n

rev/min and gauge pressure =

bar ( ~ maximum full-load control rod travel)

## **Test Specifications** Fuel Injection Pumps 1 WPP 001/4 MAN 11,9 a1 and Governors

2. Edition

PE 6 P 120 A 720 LS 470

ROV 250-1100 PA 700

superseden 83

Komb.-Nr. 0 402 046 295

Values only apply to test nozzle-and-holder

assembly 1 688 901 019 and fuel-injection test

tubing 1 680 750 067

company: MAN D2866 KF engine: 265 kW

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

## A. Fuel Injection Pump Settings

| Port closing at pres Rotational speed ray/min t | <del>- (</del> | Fuel delivery  cm <sup>3</sup> /100 strokes | Difference<br>cm³/<br>100 strokes<br>4 | Control rod<br>travel<br>mm<br>2 | RW = 9,0 - 12,<br>Fuel delivery<br>cm <sup>3</sup> /100 strokes<br>3 | Spring pre-tensioning (torque-control valve) mm 6 |
|---|----------------|---|--|----------------------------------|--|---|
| 750   | 12,5+0,        | 23,8-24,0                                   | 0,5(0,9)                               |                                  |  |   |
| 250   | 5,2-5,         | _   | 0,8(1,2)                               |                                  |  |   |
| •   |                |   |  |                                  |  |   |
|   |                | ]   |  |                                  |  |   |

Adjust the fuel delivery from each outlet according to the values in

### **B. Governor Settings**

| Upper rated s        | speed               | <u>-</u>                     |             | Intermediate         | rated sp | eed                  |          | Lower rated          | speed       | \<br>                 | Sliding s   | leeve travel   |
|----------------------|---------------------|------------------------------|-------------|----------------------|----------|----------------------|----------|----------------------|-------------|-----------------------|-------------|----------------|
| Degree of deflection | rev/min<br>Control  | Control rod travel           | •           | Degree of deflection |          | Control re<br>travel | od       | Degree of deflection |             | Control rod<br>travel |             |                |
| of control<br>lever  | rod travel<br>mm    | mm<br>rev/min                | <b>(2a)</b> | of control           | rev/min  | mm                   | <b>(</b> | of control<br>lever  | rev/min     | mm ③                  | rev/min     |                |
| 1                    | 2                   | 3                            |             | 4                    | 5        | 6                    |          | 7                    | 8           | 9                     | 10          | 11             |
| max.                 | 1170                | 15,2-17                      | ,8          | -                    | •        | -                    |          | ca.9                 | 100         | min.6,8               | 325         | 1,6-2,0        |
| ca.62                | 10,3<br>4,0<br>1350 | 1140-11<br>1225-12<br>0 - 1, | 55          |                      |          |                      |          |                      | 250<br>360- | 5,2-5,4<br>420=2,0    | 800<br>1100 | 5,3-5,5<br>7,8 |
|                      |                     |                              |             |                      |          |                      |          | <b>3a</b>            |             |                       |             |                |

Torque control travel a

## C. Settings for Fuel Injection Pump with Fitted Governor

| Full-load d<br>Control-ro<br>Test oil ter<br>rev/min |  | Rotational-speed (2b) timitation intermediate speed rev/min (4a) | high idle s              | cm <sup>2</sup> /1000 strokes  | idle<br>switchir | . •                         | Torque-<br>travel<br>rev/min<br>8 | Control 5  Control rod travel mm 9       |
|--|--|--|--------------------------|--|------------------|-----------------------------|-----------------------------------|--|
| LDA<br>750<br>LDA<br>1100                            | 1,0 bar<br>238,0-240,0<br>(235,0-243,0)<br>1,0 bar<br>213,0-219,0<br>(210,0-222,0) | 1140-1150*   | LDA<br>650<br>LDA<br>500 | 1,0 bar<br>239,0-245,0<br>236,0-248,0<br>0 bar<br>139,0-141,0<br>(136,0-144,0) |                  | 225,0-245,0<br>(221,0-249,0 | )1100<br>900                      | 12,5+0,<br>11,3+0,<br>12,1+0,<br>11,5+0, |

Checking values in brackets

\* 1 mm less control rod travel than col. 2

MAN 11,9 a 1 -2-

Testatn

500 rev/min decreasing pressure - in bar gauge pressure

| Pump/governor            | Setting              | Measurement          | diminution<br>Control rod travel-<br>difference |
|--------------------------|----------------------|----------------------|---|
|                          | Gauge pressure - bar | Gauge pressure = bar | mm (1) .  |
| PE6PLS 470<br>+RQVPA 700 | 1,0                  | 0<br>0,40<br>0,24    | 12,5-12,6<br>9,3-9,4<br>11,1-11,2<br>10,2-10,6  |

Notes

(1) when n

rev/min and gauge pressure =

bar ( = maximum full-load control rod travel)

# Test Specifications Fuel Injection Pumps ① and Governors

WPP 001/4 MAN 11,9a3
1. Edution

En

PES 6 P 120 A 720 LS 470-1 RQV 250-1100 PA 707 Komb.-Nr. 0 402 046 296 Values only apply to test nozzle-and-holder assembly 1 688 901 019 and fuel-injection test tubing 1 680 750 067

company: MAN engine 0 2866 KUL 265 kW

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

| Port closing at pres |                       | 75-2.95)                                   | mm (from BDC)                                  | RW = 9.0              | - 12.0 mm     |   |
|----------------------|-----------------------|--|--|-----------------------|---------------|---|
| Rotational speed     | Control rod<br>travel | Fuel delivery cm <sup>3</sup> /100 strokes | Difference<br>cm <sup>3</sup> /<br>100 strokes | Control rod<br>travel | Fuel delivery | Spring pre-tensioning<br>(torque-control valve)<br>mm |
| 1                    | 2                     | 3  | 4  | 2                     | 3             | 6   |
| 750                  | 12,7+0,1              | 23,0-23,2                                  | 0,5 (0,9)                                      |                       |               |   |
| 250                  | 5,4-5,6               | 1,2-1,8                                    | 0,8 (1,2)                                      |                       |               |   |
|                      |                       |  |  |                       |               |   |
|                      |                       |  |  |                       |               | <u> </u>  |

Adjust the fuel delivery from each outlet according to the values in

**B. Governor Settings** 

| Upper rated :                         | 1                                      |                                  | 1  |         |             | Lower rated                            | speed        | Sliding sleeve travel         |               |                    |
|---------------------------------------|--|----------------------------------|--|---------|-------------|--|--------------|-------------------------------|---------------|--------------------|
| Degree of deflection of control lever | rev/min<br>Control<br>rod travel<br>mm | Control rod travel mm rev/min 2a | Degree of<br>deflection<br>of control<br>lever | rev/min | travel mm 4 | deflection<br>of control<br>lever<br>7 | rev/min<br>8 | Control rod<br>travel<br>mm 3 | rev/min<br>10 | mm<br>11           |
| max.                                  | -                                      | 15,2 -17,8<br>1140-1150          | -  | •       |             | ca. 12                                 | l .          |                               |               | 1,4-1,6<br>5,0-6,2 |
| ca. 65                                | · ·                                    | 1225-1255                        |  |         |             | 330-450                                |              |                               | 1100          | 8,3                |
|                                       | 1330                                   | 0 - 1,0                          |  |         |             | <b>3</b>                               |              |                               |               |                    |

Torque control travel a = 0,4 mm

## C. Settings for Fuel Injection Pump with Fitted Governor

| Full-load delivery<br>Control-rod stop<br>Test oil temp 40°C (104°F) |   | Rotational-speed 2b timitation sitemediate speed | Fuel delivery characteristics (5e) high idle speed (5b) |   | Starting<br>Idle<br>switchir |                               | Torque ·    | Control cod |
|--|---|--|---|---|------------------------------|-------------------------------|-------------|-------------|
| rev/min  | cm³/1000 strokes                        | rev/min 4a                                       | rev/min   | cm <sup>3</sup> /1000 strakes           | rev/min                      | cm <sup>3</sup> /1000 strokes | rev/min     | mm .        |
| 1  | 2                                       | 3  | 4   | 5                                       | 6                            | 7                             | 8           | 9           |
| LUA<br>750   | 1,0 bar<br>230,0-232,0<br>(227,0-235,0) |  | LDA<br>650  | 1,0 bar<br>231,0 -237,0<br>(228,0-240,0 |                              | 225,0 -245,0<br>221,0 -249,0  | 1100<br>935 | 12,5+0,     |
| LDA<br>1100  | 1,0 bar<br>218,0-224,0<br>(215,0-227,0) |  | LDA<br>500  | 0 bar<br>128,0-130,0<br>125,0-133,0)    |                              |                               | 1010        | 12,0+0,     |

Checking values in brackets

\* 1 mm less control rod travel than col 2

MAN 11,9a3

-2-

| Test | at | n | - |  |
|------|----|---|---|--|

500

rev/min decreasing pressure – in bar gauge pressure

| Pump/governor     | Setting              | Measurement          | diminution<br>Control rod travel-<br>difference |
|-------------------|----------------------|----------------------|---|
|                   | Gauge pressure - bar | Gauge pressure = bar | mm (1) .  |
| PES 6 P. LS 470-1 | 1,0                  |                      | 12,7 - 12,8                                     |
| + RQV. PA 707     |                      | 0                    | 9,4 - 9,5                                       |
|                   |                      | 0,40                 | 11,2 - 11,3                                     |
|                   |                      | 0,19                 | 9,9 - 10,3                                      |
|                   |                      |                      |   |
|                   |                      |                      |   |
|                   |                      |                      |   |

#### Notes

(1) when n -

rev/min and gauge pressure =

bar ( - maximum full-load control rod travel)

## Test Specifications Fuel Injection Pumps 2 and Governors

WPP 001/4 MB 11.6 a

2. Edition

PE 6 P 100 A 720 RS 473 Komb.-Nr. 0 401 846 494 RO 300/1100 PA 269-1

supersedes 12.83 Daimler-Benz

OM 355 177 kW

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

mm (from BDCRW=9,0-12,0 mm Port closing at prestroke (3.45 - 3.65)

| Rotational speed rev/min |         | Fuel delivery<br>cm <sup>3</sup> /100 strokes<br>3 | Difference<br>cm <sup>3</sup> /<br>100 strokes<br>4 | Control rod<br>travel<br>mm<br>2 | Fuel delivery<br>cm <sup>3</sup> /100 strokes<br>3 | Spring pre-tensioning<br>(torque-control valve)<br>mm<br>6 |
|--------------------------|---------|--|---|----------------------------------|--|--|
| 1100                     | 13,1+0, | 12,5-12,7  | 0,35(0,6  |                                  |  | ,  |
| 300                      | 8,1-8,3 | 1,7-2,3  | 0,35(0,5  | 5)                               |  |  |
| 600                      |         | C, Sp. 4u.5  | 0,5(0,7)  |                                  |  |  |
|                          |         |  |   |                                  |  |  |

Adjust the fuel delivery from each outlet according to the values in

### **B.** Governor Settings

|                         | g of slider        | Full-load  | *                     | -                     | *****                                    | Idle spec                | _                     |         | aitiaatiaaa 🕝                            | Torque o      |                       |
|-------------------------|--------------------|--|-----------------------|-----------------------|--|--------------------------|-----------------------|---------|--|---------------|-----------------------|
| PRG che<br>rev/min<br>1 | Control rod travel | Setting portion of the setting portion of the | Control red travel mm | Control red travel mm | rev/min                                  | Setting previous reviews | Control<br>rad travel | rev/min | cifications (5) Control rod travel mm 10 | rev/min<br>11 | Control rod travel mm |
| 600                     | 15,6-16,4          | 600  | 16,0                  |                       | 1145-1160<br>1200 <b>-</b> 12 30<br>0-1, |                          | 6,1                   | 300     | min.7,5<br>6.0-6,2<br>00=2,0             | -             | •                     |
| *                       | l                  | <u> </u>   | _                     | L                     | <u> </u>                                 | L                        | 1                     | 45-1    | 60 min 1                                 |               | 1 mm less contri      |

Torque-control travel on flyweight assembly dimension a =

Speed regulation: At

1 mm less control rod travel

### C. Settings for Fuel Injection Pump with Fitted Governor

|         | elivery on<br>control lever<br>np. 40°C (104°F) | Control rod stop | 3 | Fuel deliv   | ery characteristics 3b              | Starting f   | Contrac   |
|---------|---|------------------|---|--------------|-------------------------------------|--------------|---|
| rev/min | cm <sup>3</sup> /-1000 strokes                  | rev/min<br>3     |   | rev/min<br>4 | cm <sup>3</sup> /-1000 strokes<br>5 | rev/min<br>6 | red travel<br>cm <sup>3</sup> /1000 strokes / mm<br>7 |
| 1100    | 125,0-127,0<br>(123,0-129,0)                    | -                |   | 600          | 117,0-121,0<br>(114,5-123,5)        | 100          | 150,0-170,0<br>(146,0-174,0)                          |

Checking values in brackets

## **Test Specifications** Fuel Injection Pumps (1A) and Governors

WPP 001/4 VOL 12,0g2 2. Edition

Volvo

**TID 120 FG** 

supersedes

company

engine

Εn

PE 6 P 120 A 320 RS 3075

RSV 650-750 P4/421

Komb.-Nr. 0 401 876 718 Values only apply to test nozzle-and-holder

assembly 1 688 901 019 and fuel-injection test

tubing 1 680 750 067
All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

## A. Fuel Injection Pump Settings

Port closing at prestroke

(2,55-2,75)

mm (from BDC)

| Rotational speed | Control rod | Fuel delivery  | Difference                           | Control rod<br>travel | Fuel delivery    | Spring pre-tensioning (torque-control valve) |
|------------------|-------------|----------------|--------------------------------------|-----------------------|------------------|--|
| rev/min          | mm <b>2</b> | cm/100 strokes | cm <sup>-/</sup><br>100 strokes<br>4 | mm<br>2               | cm //100 strokes | mm<br>6                                      |
| 700              | 11,8+0,1    | 23,3 - 23,5    | 0,5 (0,9)                            |                       |                  |  |
| 650              | 4,0-4,2     | 2,2 - 2,6      | 0,5 (0,7)                            |                       |                  |  |
|                  |             |                |                                      | }                     |                  |  |
|                  |             |                |                                      |                       |                  |  |

Adjust the fuel delivery from each outlet according to the values in

### **B. Governor Settings**

| Degree of | rated speed<br>Control rod<br>travel<br>mm |                                 | Intermed | liate rated  | speed | Control-<br>lever<br>deflection<br>in degrees<br>7 |               | rated speed<br>Control rod<br>travel<br>mm | 1 \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ | rque control<br> Control rod<br> travel<br> mm |
|-----------|--|---------------------------------|----------|--------------|-------|--|---------------|--|---|--|
| loose     | 800<br>x =                                 | 0,3-1,7                         | -        | <del>-</del> | -     | ca. 33   | 650<br>650    | 4,1  | -                                       | -  |
| ca. 37    | 10,8<br>4,0<br>930                         | 750-755<br>775-785<br>0,3 - 1,7 |          |              |       |  | 65 <b>0</b> - | 710= 2,0                                   |   |  |

The numbers denote the sequence of the tests

### C. Settings for Fuel Injection Pump with Fitted Governor

|                                       | ill-load stop                  | 6 Rotational-<br>speed limitat | 30 FL   | iel delivery<br>paracteristics              | Starting ( | uel delivery 5                     | <b>4a</b> Idi |                                  |  |
|---------------------------------------|--------------------------------|--------------------------------|---------|---|------------|------------------------------------|---------------|----------------------------------|--|
| rev/min cm <sup>1</sup> /1000 strokes |                                | Note changed to ) rev/min 3    | rev/min | cm <sup>3</sup> /1000 strok <b>e</b> s<br>5 | rev/min    | cm <sup>3</sup> /1000 strokes<br>7 | rev/min<br>8  | Control rod<br>travel<br>mm<br>9 |  |
| 700                                   | 233,0 - 235,0<br>(230,0-238,0) | 750 - 750*                     | 4469-   | •   | -          | -                                  | -             | -                                |  |
|                                       |                                |                                |         |   |            |                                    |               |                                  |  |

Checking values in brackets

\* 1 mm less control rod travel than col 2

6.84

Geschaftsbereich KH. Kundendienst. Kfz-Ausrustung. < 1980 by Robert Bosch GmbH. Postfach 50, D-7000 Stuttgart 1. Printed in the Federal Republic of Germany Imprimé en République Fedérale d'Allemagne par Robert Bosch GmbH.

## Test Specifications Fuel Injection Pumps ① and Governors

WPP 001/4 KHD 1 p 2

1. Edition

Testoil-ISO 4113

PE 12 P 110 A 920 LS 3081

RQV 300-1075 PA 588

supersedes

companyKHD

1 - 4- 9 - 8 - 5 - 2 - 11 - 10 - 3 - 6 - 7 - 12

engine: BF 12 L 413 FC

 $0-45-60-105-120-135-180-195-240-255-300-315^{\circ} \pm 0,5^{\circ} (\pm 0,75^{\circ})$ 

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

#### A. Fuel Injection Pump Settings

| Port closing at prestroke | 2.8-2,9       | mm (from BDC)         |
|---------------------------|---------------|-----------------------|
| Off Closing at brestroke  | (2, 75-2, 95) | (IIII) (II GIII GO G) |

| 1 | Rotational speed | Control rod<br>travel<br>mm | Fuel delivery  cm³/100 strokes | Difference<br>cm <sup>3</sup> /<br>100 strokes<br>4 | Control rod<br>travel<br>mm | Fuel delivery<br>cm <sup>3</sup> /100 strokes<br>3 | Spring pre-tensioning<br>(torque-control valve)<br>mm<br>6 |
|---|------------------|-----------------------------|--------------------------------|---|-----------------------------|--|--|
|   | 1075             | 11,2+0,1                    | 13,2 - 13,6                    | 0,4 (0,8)   |                             |  |  |
|   | 300              | 6,7-6,9                     | 1,6- 2,2                       | 0,4 (0,7)   |                             |  |  |
| İ |                  |                             |                                |   |                             |  |  |
|   |                  |                             |                                |   |                             |  |  |

Adjust the fuel delivery from each outlet according to the values in

## **B. Governor Settings**

| Upper rated s | peed               |                | Intermediate         | rated sp | eed                   | Lower rated          | speed   |                       | Sliding s  | leeve travel       |
|---------------|--------------------|----------------|----------------------|----------|-----------------------|----------------------|---------|-----------------------|------------|--------------------|
|               | rev/min<br>Control | Control rod to | Degree of deflection |          | Control rod<br>travel | Degree of deflection |         | Control rod<br>travel |            | . ①                |
|               | rod travel         |                | of control           | rov/min  | mm (4)                | of control<br>lever  | rev/min | mm (3)                | rev/min    | mm                 |
| 1             | 2                  | 3              | 4                    | 5        | 6                     | 7                    | 8       | 9                     | 10         | 11                 |
| max.          | 1125               | 15,2-17,8      | -                    | -        | -                     | ca. 13               | 100     | min.8,3               | 250        | 0,6-0,8            |
| ca. 65        | 10,2               | 1115-1125      |                      |          |                       |                      | 300     | 6,7-6,9               | 525<br>800 | 3,5-3,7<br>5,8-6,0 |
|               | 4,0                | 1175-1205      | l                    |          |                       | 350-500              | 1       |                       | 1075       | 8,1                |
| [             | 1300               | 0-1,0          |                      |          |                       | Į                    |         |                       |            |                    |
|               |                    |                |                      |          |                       | <b>3</b>             |         |                       |            |                    |

Torque control travel a =

mm

## C. Settings for Fuei Injection Pump with Fitted Governor

| Full-load d<br>Control-ro<br>Test oil ten |  | limitation<br>intermediate speed | Fuel delic<br>high idle s | rery characteristics (5e)   | Starting<br>idle<br>switchir |                               | Torque-<br>travel | Control 5 Control rod |
|---|--|----------------------------------|---------------------------|---|------------------------------|-------------------------------|-------------------|-----------------------|
| rev/min                                   | cm³/1000 strokes                         | rev/min 4a                       | rev/min                   | cm <sup>3</sup> /1000 strokes   | rev/min                      | cm <sup>3</sup> /1000 strokes | rev/min           | mm                    |
| 1   | 2  | 3                                | 4                         | 5   | 6                            | 7                             | 8                 | 9                     |
| LDA<br>1075                               | 0,75 bar<br>132,0-136,0<br>(130,0-138,0) | 1115 - 1125*                     | LDA<br>850<br>LDA<br>500  | 0,75 bar<br>129,0-133,0<br>(126,0-136,0)<br>0 bar<br>82,0- 84,0<br>(78,0- 88,0) |                              | 130, 0- 150, 0                | •                 | -                     |

Checking values in brackets

\* 1 mm less control rod travel than col. 2

KHD 1 p 2

Test at n =

500

rev/min decreasing pressure - in bar gauge pressure

| Pump/governor               | Setting            | Measurement          | diminution<br>Control rod travel-<br>difference      |
|-----------------------------|--------------------|----------------------|--|
|                             | Gauge pressure bar | Gauge pressure = bar | mm (1) .   |
| PE 12 PLS 3081 with. PA 588 | . 0,75             | 0<br>0,35<br>0,23    | 11,2 - 11,3<br>9,2 - 9,3<br>10,4 - 10,5<br>9,6 - 9,8 |

Testoil-ISO 4113

Notes
(1) when n =

rev/min and gauge pressure =

bar (= maximum full-load control red travel)

Testoil-ISO 4113

## Test Specifications Fuel Injection Pumps ② and Governors

WPP 001/4 UNI 9.6 a 2

1. Edition

PES 6 P 110 A 720 RS 3105

RQ 275/1150 PA 711

Komb -- Nr. 0 402 046 748

supersedes ...

company.

UNIC-IVECO 8220-22.709

177 kW

All test specifications are valid for Bosch Fuel Injection Pump Test/Benches and Testers

#### A. Fuel Injection Pump Settings.

Port closing at prestroke

mm (from BDC)

| Rotational speed rev/min 1 | Control rod<br>travel<br>mm<br>2 | Fuel delivery<br>cm <sup>3</sup> /100 strokes<br>3 | cm³/      | Control rod<br>travel<br>mm<br>2 | Spring pre-tensioning<br>(torque-control valve)<br>mm<br>6 |
|----------------------------|----------------------------------|--|-----------|----------------------------------|--|
| 1150                       | 11,3+0,1                         | 11,4-11,7  | 0,4(0,75) |                                  |  |
| 275                        | 5,9-6,1                          | 1,5-2,0  | 0,45(0,75 | )                                |  |
|                            |                                  |  |           |                                  |  |
|                            |                                  |  |           |                                  |  |

Adjust the fuel delivery from each outlet according to the values in

#### **B. Governor Settings**

| Checkin    | g of slider<br>ck                   | Full-load :<br>Setting po | *                                | _                                 | cifications  | <b>(4)</b> | Idle spec    | _                                  |              | cifications (5)                   | Torque o      | (                                 | (3) |
|------------|-------------------------------------|---------------------------|----------------------------------|-----------------------------------|--------------|------------|--------------|------------------------------------|--------------|-----------------------------------|---------------|-----------------------------------|-----|
|            | Control rod<br>travel<br>mm<br>2    | rev/min<br>3              | Centrel<br>red travel<br>mm<br>4 | Control<br>red travel<br>rmm<br>5 | rev/min<br>6 |            | rev/min<br>7 | Control<br>red travel<br>rnrn<br>8 | rev/min<br>9 | Control rod<br>travel<br>mm<br>10 | rev/min<br>11 | Control rod<br>travel<br>mm<br>12 |     |
| 600<br>VH= | 19,2-20,8<br>max. 46°               | 600                       | 20,0                             | 10,3<br>4,0<br>1400               | 1245-13      | 375        |              | 6,0                                |              | min.7,5<br>5,9-6,1<br>90=2,0      |               | 11,3-11,4<br>11,3-11,             |     |
|            | ontrol travel<br>ght assembly dimer | nsion a =                 | 0                                | mm                                |              | Spe        | ed regula    |                                    | 95-12        | 10 min <sup>-1</sup>              |               | 1 mm less co                      |     |

### C. Settings for Fuel Injection Pump with Fitted Governor

|              | delivery on control lever mp 40°C (104°F) | Control rod stop 3a | Fuel deliv | ery characteristics                 | 36) | Starting f   | uel delivery<br>d Control               |
|--------------|---|---------------------|------------|-------------------------------------|-----|--------------|---|
| rev/min<br>1 | cm <sup>3</sup> /-1000 strokes<br>2       | rev/min<br>3        | rev/min    | cm <sup>3</sup> /-1000 strokes<br>5 |     | rev/min<br>6 | cm <sup>3</sup> /1000 strokes / mm<br>7 |
| LDA<br>1150  | 0,7 bar<br>114,0-117,0<br>(111,5-119,5)   |                     | LDA<br>400 | 0 bar<br>75,0-78,0<br>(72,5-80,5)   |     | 100          | 160,0-180,0<br>156,0-184,0)             |

Checking values in brackets

UNI 9,6 a 2

- 2 -

Test at n =

500

rev/min decreasing pressure - in bar gauge pressure

| Pump/governor                | Setting              | Measurement          | diminution<br>Control rod travel difference      |
|------------------------------|----------------------|----------------------|--|
|                              | Gauge pressure = bar | Gauge pressure = bar | mm (1) .   |
| PES 6 PRS 3105<br>+RQ PA 711 | 0,70                 | 0<br>0,26<br>0,20    | 11,3-11,4<br>10,0-10,1<br>10,9-11,0<br>10,3-10,5 |

Notes

(1) when n

rev/min and gauge pressure = bar ( = maximum full-load control rod travel)

## Test Specifications Fuel Injection Pumps (A) and Governors

40

WPP 001/4 PEN 12,0e 1 Edition

Εn

PE 6 P 120 A 320 RS 3121 RSV 200-900 P4/421 R Komb.-Nr. 0 401 876 732 Values only apply to test nozzle-and-holder assembly 1 688 901 019 and fuel-injection test tubing 1 680 750 067
All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

company Volvo-Penta
TAMD 121 C

## A. Fuel Injection Pump Settings

Port closing at prestroke

2,6 - 2,7 (2,55-2,75)

mm (from BDC)

|                  | (-,-                  | 35 2,707         |                                 |                    |                              |  |
|------------------|-----------------------|------------------|---------------------------------|--------------------|------------------------------|--|
| Rotational speed | Control rod<br>travel | Fuel delivery    | Difference                      | Control rod travel | Fuel delivery                | Spring pre tensioning (torque-control valve) |
| rey/min          | mm (2)                | cm //100 strokes | cm <sup>-/</sup><br>100 strokes | mm                 | cm <sup>-</sup> /100 strokes | mm   |
| 1                | 2                     | 3                | 4                               | 2                  | 3                            | 6  |
| 700              | 11,8+0,1              | 23,7 - 23,9      | 0,5 (0,9)                       |                    |                              | 2,5 <sup>±</sup> 0,1                         |
| 200              | 5,5-5,7               | 1,6 - 2,2        | 0,5 (0,7)                       |                    |                              | (2,2 - 2,9)                                  |
|                  |                       |                  |                                 |                    |                              | 1  |
|                  |                       |                  |                                 |                    |                              |  |
| Ì                |                       |                  |                                 |                    |                              |  |

Adjust the fuel delivery from each outlet according to the values in

**B.** Governor Settings

| Degree of deflection of control lever | Control rod<br>travel<br>mm |                               | intermo | ediate rate | ed speed | Control-<br>lever<br>deflection<br>in degrees<br>7 |            | rated speed<br>Control rod<br>Itavel<br>mm | 11 3 1 | rque controt<br>Controt rod<br>travet<br>mm |
|---------------------------------------|-----------------------------|-------------------------------|---------|-------------|----------|--|------------|--|--------|---|
| loose                                 | 800<br>×                    | 0,3-1,7<br>= 4,0              | -       | -           | -        | ca.20  | 200<br>200 | 5,1<br>5,5-5,7                             | -      | -   |
| ca. 53                                | 4,0                         | 940-950<br>970-1000<br>,3-1,7 |         |             |          |  | 265-325    | = 2,0                                      |        |   |

The numbers denote the sequence of the tests

## C. Settings for Fuel Injection Pump with Fitted Governor

| (4)     | emp 40°C (104°F)                   | Rotational speed limital |         | nel delivery<br>aracteristics | Starting fi | uel delivery 5        | 4a) 'd'      | e stop<br> Control rod |
|---------|------------------------------------|--------------------------|---------|-------------------------------|-------------|-----------------------|--------------|------------------------|
| revimin | cm <sup>1</sup> /1000 strokes<br>2 | changed to ) rev/min 3   | rev/min | cm/1000 strokes<br>5          | rev/min     | cm·/1000 strokes<br>7 | rev/min<br>8 | travel<br>mm<br>9      |
| 700     | 237,0 - 239,0<br>(234,0 - 242,0)   | * 940-950                | -       | -                             | -           | -                     | _            | -                      |
|         |                                    |                          |         |                               |             |                       |              |                        |

Checking values in brackets

\* 1 mm tess control rod travel than col 2

BOSCH

Geschaftsbereich KH: Kundendienst Kfz-Ausrustung 

1980 by Robert Bosch GmbH, Postlach 50, D-7000 Stultgart 1: Printed in the Federal Republic of Germany 
Imprimé en République Fédérale d'Allemagne par Robert Bosch GmbH

nm less control rod travel than col

## **Test Specifications** Fuel Injection Pumps 2 and Governors

WPP 001/4 MB 11,0 c 1 5. Edition

PE 6 P 110 A 320 LS 3805 RQ 300/1150 PA 187-6 Komb.-Nr. 0 401 846 749 

company Daimler-Benz OM 421

See Service Information VDT-I-401/102

159 kW (216 PS)

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 14 45-4 15) mm (from BDCZyl. 6; RW = 9,0 - 12,0 mm

| Rotational speed rev/min | Control rod<br>travel<br>mm | Fuel delivery  # cm <sup>3</sup> /100 strokes 3 |          | Control rod<br>travel<br>mm<br>2 | *              | Spring pre-tensioning<br>(torque-control valve)<br>mm<br>6 |
|--------------------------|-----------------------------|---|----------|----------------------------------|----------------|--|
| 1150                     | 12,5+0,1                    | 12,8-13,0                                       | 0,4(0,8) | 12,4+0,1                         | 13,2-13,4      | ,  |
| 300                      | 8,3-8,5                     | 1,2-1,8   | 0,4(0,7) | 8,3-8,5                          | 1,2-1,8        |  |
| 600                      | -                           | C, Sp. 4 u. 5                                   | 0,6(0,9) | -                                | C, Sp. 4 u. 5  |  |
| *                        | with ret                    | urn throttlc (1                                 |          | *                                | without return | throttle (2)   |

Adjust the fuel delivery from each outlet according to the values in

## **B.** Governor Settings

| Checkin | g of slider   | Full-load s | •                                | -                     | cifications (4)                   | Idle spec | -                     |                    | cifications (5)                 | Torque d      |                             |
|---------|---------------|-------------|----------------------------------|-----------------------|-----------------------------------|-----------|-----------------------|--------------------|---------------------------------|---------------|-----------------------------|
| rev/min | Control rod   | rev/min     | Control<br>red travel<br>mm<br>4 | Central red travel mm | rev/min                           |           | Centrel<br>red travel | rev/min<br>9       | Control rod travel              | rev/min<br>11 | Control rod<br>travel<br>mm |
| 650     | 13,2-14,0     | 650         | 13,6                             | 11,5<br>4,0<br>1350   | 1195-1210<br>1240-1270<br>0 - 1,0 |           | 8,4                   | 100<br>300<br>430- | min.10,0<br>8,3-8,5<br>470 =2,0 | -             | -                           |
|         | onitol travel |             | <u> </u>                         | <u> </u>              | L                                 | <u></u>   |                       | 1195-              | 1210 min                        |               | 1 mm less contr             |

Torque-control travel

1 mm less control rod travel

## C. Settings for Fuel Injection Pump with Fitted Governor

|              | elivery on ontrol lever p 40°C (104°F) | Control rod stop 3a | Fuel deliv | ery characteristics (3b)       | Starting f   | ruel delivery                                  |
|--------------|--|---------------------|------------|--------------------------------|--------------|--|
| rev/min<br>1 | cm <sup>3</sup> /-1000 strokes         | rev/min<br>3        | rev/min    | cm <sup>3</sup> /-1000 strokes | rev/min<br>6 | red travel cm <sup>3</sup> /1000 strokes:/ rnm |
| (1)<br>1150  | 128,0-130,0<br>(125,0-133,0)           | 600                 | 600        | 120,0-124,0<br>(117,0-127,0)   | 100          | 130,ú-150,0<br>(126,0-154,0)                   |

Checking values in brackets

| Checkin<br>PRG che | g of slider<br>ck (1)       | Full-load | -                           | _                                 | cifications (4)                   | tdle spec    | -                                |         | cifications (5)                 | Torque o | (3)                         |
|--------------------|-----------------------------|-----------|-----------------------------|-----------------------------------|-----------------------------------|--------------|----------------------------------|---------|---------------------------------|----------|-----------------------------|
| rev/min            | Control rod<br>travel<br>mm | rev/min   | Control<br>rod travel<br>mm | Control<br>red travel<br>rnm<br>5 | rev/min                           | rev/min<br>7 | Control<br>rod travel<br>mm<br>8 | rev/min | travel<br>mm                    | rev/min  | Control rod<br>travel<br>mm |
| 650                | 13,2-14,0                   | 650       | 13,6                        |                                   | 1195-1210<br>1240-1270<br>0 - 1,0 | 300          | 8,4                              | 300     | min.10,0<br>8,3-8,5<br>70 = 2,0 | -        | -                           |
| lorma r            | ontrol travel               |           | <u> </u><br>                |                                   |                                   |              |                                  | 195-1   | <br> 210 min <sup>-1</sup>      |          | 1 mm less contro            |

on flyweight assembly dimension a

Speed regulation At

## C. Settings for Fuel Injection Pump with Fitted Governor

|             | delivery on control lever mp 40 C 1104 F1 | Control rod stop | Fuel deliv | ery characteristics 3b         | Starting fi<br>Idle spee | duel delivery                      |
|-------------|---|------------------|------------|--------------------------------|--------------------------|------------------------------------|
| rev/min     | cm'/-1000 strokes                         | rev/min          | rev/min    | cm <sup>1</sup> /-1000 strokes | rev/min                  | cm <sup>3</sup> /1000 strokes / mm |
| (2)<br>1150 | 132,0-134,0<br>(129,5-136,5)              | 600              | 600        | 110,0-114,0<br>(107,0-117,0)   | 100                      | 130,0-150,0<br>(126,0-154,0)       |
|             | · † † † †                                 |                  |            |                                |                          |                                    |
|             |   |                  | 1          |                                |                          |                                    |

Checking values in brackets

Testoil-ISO 4113

## **B. Governor Settings**

| Checlon | g of slider                 | Full load |                             |                              | cifications (4) | ldle spec    | oint                              |              | cifications (5)             | Torque c | (3)                         |
|---------|-----------------------------|-----------|-----------------------------|------------------------------|-----------------|--------------|-----------------------------------|--------------|-----------------------------|----------|-----------------------------|
|         | Control rod<br>travel<br>mm | rev/min   | Control<br>rod travel<br>mm | Control<br>rod travel<br>rnm | rev/min         | rev/min<br>7 | Control<br>rod travel<br>rmm<br>8 | rev/min<br>9 | Control rod<br>travel<br>mm |          | Control rod<br>travel<br>mm |
|         |                             |           |                             |                              |                 |              |                                   |              |                             |          |                             |
|         |                             |           | !                           |                              |                 |              |                                   |              |                             |          |                             |
|         |                             |           |                             |                              |                 |              |                                   |              |                             |          |                             |

Torque control travel on flyweight assembly dimension a

Speed regulation At

1 mm less control

## C. Settings for Fuel Injection Pump with Fitted Governor

| governor | lelivery on<br>control lever<br>np 40°C (104 F) | Control rod slop | Fuel deliv | ery characteristics 3b | Starting for | Control   |
|----------|---|------------------|------------|------------------------|--------------|---|
| rev/min  | cm*/-1000 strokes                               | rev/min -        | rev/min    | cm³/-1000 strokes<br>5 | rev/min      | red fra <del>rel</del><br>cm <sup>3</sup> /1000 strokes / mm<br>7 |
|          |   |                  |            |                        |              |   |
|          |   |                  |            |                        |              |   |
|          |   |                  |            |                        |              |   |
|          |   |                  |            |                        |              |   |

## **Test Specifications** Fuel Injection Pumps 2 NPP 001/4 HB 11,0h and Governors

3. Edition

RO 750 PA 374 R PE 6 P 110 A 320 LS 3805 Komb.-Nr. U 401 846 738 1 - 6 - 3 - 5 - 2 - 4 0 - 75 - 120 - 195 - 240 - 315° + 0,5° (+0,75°)See Service Information VDT-I-401/102

supersede 7.81 company Daimler Benz OM 421 116 kW (158 PS)

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection, Pump Settings

4.00-4.10 Port closing at prestroke

mm (from BDC) RW 10,5 / Zyl. 6

| Rotational speed | Control rod<br>travel<br>mm | Fuel delivery  cm <sup>3</sup> /100 strokes | Difference<br>cm³/<br>100 strokes | Control rod<br>travel<br>mm<br>2 | *              | Spring pre-tensioning<br>(torque-control valve)<br>mm<br>6 |
|------------------|-----------------------------|---|-----------------------------------|----------------------------------|----------------|--|
| 700              | 13,8+0,                     | 14, 1 - 14, 3                               | 0,4(0,8                           | 13,8+0,                          | 1 14, 1-14,3   | ·  |
| <b>30</b> 0      | 8,2-8,4                     | 1,3-1,9                                     | 0,4(0,7)                          | 8,2-8,4                          | 1,3-1,9        |  |
| * with           | return                      | throttlc (1)                                |                                   | ,                                | without return | throttle (2)   |
|                  |                             |   | <u> </u>                          |                                  |                |  |

Adjust the fuel delivery from each outlet according to the values in

## **B. Governor Settings**

| PRG che | g of slider<br>ck<br>Control rod | Full-load s  |   |             |                    | idle spec<br>Setting p | ooint<br>Centrel | Test spe     | cifications 5      | Torque d      | control Control rod I travel |
|---------|----------------------------------|--------------|---|-------------|--------------------|------------------------|------------------|--------------|--------------------|---------------|------------------------------|
|         | travel                           | rev/min<br>3 |   | red travel  | rev/min<br>6       | rev/min<br>7           | l .              | rev/min<br>9 | travel<br>mm<br>10 | rev/min<br>{1 |                              |
| -       | •                                | -            | - | 12,8<br>4,0 | 750-755<br>795-805 | -                      | -                | -            | -                  | -             | -                            |
|         |                                  |              |   |             |                    |                        |                  |              |                    |               |                              |

Torque-control travel on flyweight assembly dimension a =

Speed regulation: At

1 mm less control rod travel

## C. Settings for Fuel Injection Pump with Fitted Governor

| Full-load de<br>governor co<br>Test oil tem | elivery on ontrol lever p. 40°C (104°F) | Control rod stop 3a | Fuel delive  | ery characteristics                 | 3 | Starting for<br>Idle spee | d Confroi                  |
|---|---|---------------------|--------------|-------------------------------------|---|---------------------------|----------------------------|
| rev/min                                     | cm³/-1000 strokes                       | rev/min<br>3        | rev/min<br>4 | cm <sup>3</sup> /~1000 strokes<br>5 |   | rev/min<br>6              | cm³/1000 strokes / mm<br>7 |
| 700<br>(1) u.<br>(2)                        | 141,0 - 143,0<br>(138,0 - 146,0)        | -                   | -            | -                                   |   | 100                       | 130,0 - 150,0              |

Checking values in brackets

WPP 001/4 MB 11.0 c 2

3. Edition

PE6P!10A 320LS 3805 Komb.-Nr. 0 401 846 748 ROV 300-1150PA 524-4

9.83 supersedes

Daimler-Benz company. OM 421 engine

1 - 6 - 3 - 5 - 2 - 4  $0 - 75-120-195-240-315^{\circ} -0,5^{\circ}(-0,75^{\circ})$ 

159 kW (216 PS)

Note VDT-I-401/102

v: 🎷

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

## A. Fuel Injection Pump Settings

| Port closing at pres | trake (3,             | 95-4,15)                         | mm (from BDC) 2                                | Zyl. 6; P.            | 14=9,0-12,0 mm                   |  |
|----------------------|-----------------------|----------------------------------|--|-----------------------|----------------------------------|--|
| Rotational speed     | Control rod<br>travel | Fuel delivery  * cm³/100 strokes | Difference<br>cm <sup>3</sup> /<br>100 strokes | Control rod<br>travel | Fuel delivery  ± cm³/100 strokes | Spring pre-tensioning<br>(torque-control valve)<br>mm<br>6 |
|                      | *                     | 3                                | -  | -                     |                                  |  |
| 1150                 | 12,5+0,               | 1 12,8-13,0                      | 0,4(0,8)                                       | 12,4+0,1              | 13.2-13.4                        |  |
| 300                  | 8,3-8,                | 5 1,2-1,8                        | 0,4(0,7)                                       | 8,3-8,5               | 1,2-1,8                          |  |
| 600                  | -                     | C. ip. 4 u.5                     | 0,6(0,9)                                       | -                     | C, Sp. 4 u. 5                    |  |
| * with               | return t              | hrottlc (1)                      |  | *                     | without return                   | throttle (2)   |

Adjust the fuel delivery from each outlet according to the values in

#### **B. Governor Settings**

|            |   |                                  |            | e rated ap   |                               | Lower rated                                    | speed        | Control rod | Sliding sleeve travel |                 |
|------------|---|----------------------------------|------------|--------------|-------------------------------|--|--------------|-------------|-----------------------|-----------------|
| deflection | rev/min<br>Controt<br>rod travel<br>mm<br>2 | Control rod travel mm rev/min 28 | of control | rev/min<br>5 | Control rod<br>travel<br>mm 4 | Degree of<br>deflection<br>of control<br>lever | rev/min<br>8 | travel      | rev/min<br>10         | (1)<br>mm<br>11 |
| max.       | 1150  | 15,2-17,8                        | -          | -            | -                             | ca.19  | 100          | min.10,0    | 250                   | 1,0-1,2         |
| ca.65      | 11,5  | 1190-1200                        |            |              |                               |  | 300          | 8,3-8,5     | 550                   | 3,4-3,7         |
|            | 4,0   | 1240-1270                        |            |              | =                             |  |              |             | 850                   | 4,9-5,3         |
|            | 1400  | 0-1,0                            |            |              |                               | 330-73<br>39                                   | b            |             | 1150                  | 7,7             |

Torque control travel a =

## C. Settings for Fuel Injection Pump with Fitted Governor

| Full-load de<br>Control-ros<br>Test oil ten |                              | Rotational-speed (2b) limitation intermediate speed | Fuel deliv | rery characteristics 58 peed 50 | Starting<br>Idle<br>switchir | . •                           | Torque-<br>travel | control 5    |
|---|------------------------------|---|------------|---------------------------------|------------------------------|-------------------------------|-------------------|--------------|
| rev/min                                     | cm³/1000 strokes             | rev/min   | rev/min    | cm <sup>3</sup> /1000 strokes   | rev/min                      | cm <sup>3</sup> /1000 strokes | rev/min           | travel<br>mm |
| 1   | 2                            | 3   | 4          | 5                               | 6                            | 7                             | 8                 | 9            |
| 1150<br>(1)                                 | 128,0-130,0<br>(125,0-133,0) | 1190-1200*  | 600        | 120,0-124,0<br>(117,0-127,0     |                              | 130,0-150,0                   | -                 | -            |

Checking values in brackets

\* 1 mm less control rod travel than col 2

| D. GUIT               | ;;;;; <b>;</b> ;; | 061111130               |                                       |           |                       |            |                                       |            |                      |           |             |                    |
|-----------------------|-------------------|-------------------------|---------------------------------------|-----------|-----------------------|------------|---------------------------------------|------------|----------------------|-----------|-------------|--------------------|
| Upper rated s         | peed              |                         | Intermediale                          | rated spi | eed                   |            | Lower rated                           | speed      |                      |           | Sliding sl  | eeve travel        |
| deflection of control | Control rodtravel | Control rod (1a) travel | Degree of deflection of control lever | rev/min   | Control rod<br>travel | <b>4</b> ) | Degree of deflection of control lever | rev/min    | Control re<br>travel | od<br>(3) | rev/min     | mm (1)             |
| lever                 | imm               | rev/min (2a             | 4                                     | 5         | 6                     |            | 7                                     | 8          | 9                    |           | 10          | 11                 |
| max.                  | 1170              | 15,2-17,8               | -                                     | -         |                       | -          | ca.19                                 | 100<br>300 | min. 1<br>8,3-8      |           | 250<br>550  | 1,0-1,2<br>3,4-3,7 |
| ca. 65                |                   | 1190-1200               | I                                     |           |                       |            |                                       |            | , -,-                | •         | 850<br>1150 | 4,9-5,3            |
|                       | 1400              | 1                       |                                       |           |                       |            | 330-73                                | •          |                      |           | 1130        | ,,,                |
|                       |                   |                         |                                       |           |                       |            | (3a)                                  |            |                      |           |             |                    |

Torque control travel a

mm

C. Settings for Fuel Injection Pump with Fitted Governor

| Full load de |                             | Potational speed (20) | Fuel deliv | ery characteristics (5a)           | Starting I<br>Idle<br>switchin |                             | Torque-<br>travel | Control rod  |
|--------------|-----------------------------|-----------------------|------------|------------------------------------|--------------------------------|-----------------------------|-------------------|--------------|
| rev/min      | cm /1000 strokes            | rev/min 4a            | rev/min    | cm <sup>1</sup> /1000 strokes<br>5 | rev/min                        | cm /1000 strokes<br>7       | rev/min<br>8      | travel<br>mm |
| 1150         | 132,0-134,0<br>(129,5-136,5 | 1190-1200*<br>)       | 600        | 110,0-114,0<br>(107,0-117,0)       | 100                            | 130,0-150,0<br>(126,0-154,0 | -                 | -            |
| !            |                             |                       |            |                                    |                                |                             |                   |              |
|              |                             |                       |            |                                    |                                |                             |                   |              |

Checking values in brackets

Testoil-ISO 4113

\* 1 mm less control rad travel than col. 2

**B. Governor Settings** 

| Upper rated          | Upper rated speed |               |      | Intermediate         | ed       | Lower rated            | speed                | Stiding s | Stiding steeve travel |         |    |
|----------------------|-------------------|---------------|------|----------------------|----------|------------------------|----------------------|-----------|-----------------------|---------|----|
| Degree of deflection | Control           | Control rod   | (la) | Degree of deflection | 1        | Control rod<br>Itravel | Degree of deflection | i         | Control rod<br>travel |         | •  |
| of control           | rod travel        | mm<br>fev/min | (2a) | of control<br>tever  | rev/min  | mm (4)                 | of control<br>lever  | rev/min   | mm (                  | rev/min | mm |
| 1                    | 2                 | 3             |      | 4                    | 5        | 6                      | 7                    | 8         | 9                     | 10      | 11 |
| i i santa a          |                   |               |      |                      |          |                        |                      | ]         |                       |         |    |
|                      |                   |               |      |                      | <u> </u> |                        |                      | İ         | İ                     |         |    |
| i                    |                   |               |      |                      |          |                        |                      |           |                       | 1       | 1  |
|                      |                   |               |      |                      |          |                        |                      | 1         |                       |         |    |
| ;                    |                   |               |      |                      |          |                        |                      | 1         |                       |         |    |
|                      |                   |               |      |                      |          |                        | 39                   |           |                       |         |    |

mm

C. Settings for Fuel Injection Pump with Fitted Governor

| Full load delivery<br>Control rod stop<br>Test oil temp 40°C (104 F) |                   | intermediate speed | Fuel deln<br>high idle s | rery characteristics (5a)     | Starting<br>Idle<br>switching | fuel dalivery 8<br>ng point | Torque-<br>travel | Control rad |
|--|-------------------|--------------------|--------------------------|-------------------------------|-------------------------------|-----------------------------|-------------------|-------------|
| revimin  | cm 1/1000 strokes | rev/min            | rev/min                  | cm <sup>3</sup> /1000 strokes | rev/min                       | 7                           | rev/min<br>B      | mm<br>9     |
|  |                   |                    |                          |                               |                               |                             |                   |             |
|  |                   |                    |                          |                               |                               |                             |                   |             |
|  |                   |                    |                          |                               |                               |                             |                   |             |
|  |                   |                    |                          |                               |                               |                             |                   |             |

Checking values in brackets

En

\* 1 mm less control rod travel than col 2

Festoil-ISO 4113

## **Test Specifications** Fuel Injection Pumps and Governors

supersedes 10.82

Daimler-Benz

243 kW (330 PS)

OM 422 A

WPP 001/4 MB 14.6 f Edition

endine

PE8P120A320LS3811

RO 300/1150 PA 556 Values only apply to test nozzle-and-holder assembly 1 688 901 019 and fuel-injection test

tubing 1 680 750 067

Komb.-Nr. 0 401 848 734

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

### A. Fuel Injection Pump Settings

Porticiosing at prestroke

(3.95-5.15)

| Relational speed rev/min | Control rod<br>travel<br>mm<br>2 | Fuel delivery  cm <sup>3</sup> /100 strokes 3 | Difference<br>cm³/<br>100 strokes<br>4 | Control rod<br>travel<br>mm<br>2 | Fuel delivery<br>cm <sup>3</sup> /100 strokes<br>3 | Spring pre-tensioning<br>(torque-control valve)<br>mm<br>6 |
|--------------------------|----------------------------------|---|--|----------------------------------|--|--|
| 1150<br>300              | 10.4+0.1<br>5,0-5,2              | 1   | 0,4(0,8)<br>0,8(1,2)                   | 1                                |  |  |
|                          |                                  |   |  |                                  |  |  |

Adjust the fuel delivery from each outlet according to the values in

#### **B. Governor Settings**

| Checking of slider                  | Full load speed re                    |   | ldle speed regula            | ation<br>  Test specifications               | Torque control                               |
|-------------------------------------|---------------------------------------|---|------------------------------|--|--|
| Control rod<br>travel<br>rev/min mm | Setting point  Control  rev/min  3  4 | Test specifications Control rod travel mm 5 | Control red travel rev/min 8 | Control rod                                  | Control rod<br>travel<br>rev/min mm<br>11 12 |
| 500 14,7-16,3                       | 600 15,5                              | 9,4 1195-1210<br>4,0 1225-1255              | 300 4,2                      | 100 min.6,0<br>300 4,1-4,2<br>340-380=2,0 mm |  |

Torque control travel on flyweight assembly dimension a

Speed regulation At 1195-1210 min

1 mm less control rod travel

### C. Settings for Fuel Injection Pump with Fitted Governor

| governor | lelivery on control lever mp 40°C (104 F) | Control rod stop | Fuel delive | ery characteristics              | Starting t | uel delivery    |  |
|----------|---|------------------|-------------|----------------------------------|------------|-----------------|--|
| rev/min  | cm <sup>1</sup> /~1000 strokes            | rev/min          | rev/min     | cm³/-1000 strokes                | rev/min    | cm³/100 strokes |  |
| 1150     | 162,0 - 164,0<br>(159,0 - 167,0)          | •                | 600         | 152,0 - 158,0<br>(149,0 - 161,0) | 100        | 125 - 145       |  |
|          |   |                  |             |                                  |            |                 |  |

Checking values in brackets

6.84

## Test Specifications Fuel Injection Pumps ② and Governors

40

WPP 001/4 MB 18,3 c

3. Edition

En

PE 10 P 110 A 320 LS 3818

RQ 300/1150 PA 437-2

$$1 - 8 - 7 - 6 - 3 - 5 - 2 - 10 - 9 - 4$$
  
 $0 - 27 - 72 - 99 - 144 - 171 - 216 - 243 - 288 - 315° - 0,5° (+0,75°)$ 

supersed & . 83 company Daimler-Benz engine: OM 423 261 kW (355 PS)

Komb.-Nr. 0 401 849 705

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

## A. Fuel Injection, Pump, Settings

Port closing at prestroke

(3.95-4.15)

mm (from BDCLvl. 10:

| Rotational speed rev/min | Control rod<br>travel<br>mm<br>2 | Fuel delivery<br>cm <sup>3</sup> /100 strokes<br>3 | Difference<br>ඒක <sup>3</sup> /<br>100 strokes<br>4 | Control rod<br>travel<br>mm<br>2 | Fuel delivery<br>cm <sup>3</sup> /100 strokes<br>3 | Spring pre-tensioning<br>(torque-control valve)<br>rnm<br>6 |
|--------------------------|----------------------------------|--|---|----------------------------------|--|---|
| 1150                     | 11,1+0,1                         | 12,4 - 12,6  | 0,4 (0,8)   |                                  |  |   |
| 300                      | 7,9-8,1                          | 1,2 - 2,0  | 0,4 (0,7)   |                                  |  |   |
| 600<br>90 <b>0</b>       | -                                | C, Sp. 4 u.5                                       | (0,9)   |                                  |  |   |

Adjust the fuel delivery from each outlet according to the values in

#### **B. Governor Settings**

| Checking of slider Full-load speed r PRG check Setting point |                                  | •       | •                           | cifications (4)                   | Idle speed regulation Setting point   Test specifications (5) |         |                                   |              | Torque control                    |               |                                  |
|--|----------------------------------|---------|-----------------------------|-----------------------------------|---|---------|-----------------------------------|--------------|-----------------------------------|---------------|----------------------------------|
| rev/min  | Control rod<br>travel<br>mm<br>2 | rev/min | Control<br>red travel<br>mm | Centrel<br>red travel<br>rnm<br>S | rev/min<br>6  | rev/min | Control<br>rod travel<br>rmm<br>8 | rev/min<br>9 | Control rod<br>travel<br>mm<br>10 | rev/min<br>11 | Control rod (                    |
| 600  | 13,0-14,                         | 0 600   | 13,5                        |                                   | 1190-1205<br>1225-1255<br>0 - 1,5                             |         | 6,1                               | 300          | min.7,7<br>6,0-6,2<br>425= 2,0    | 600           | 11,1+0,1<br>11,7+0,2<br>11,6+0,2 |

Torque-control travel on flyweight assembly dimension a =

0,2 mm

Speed regulation: At 1190 - 1205 min

i mm less control

#### C. Settings for Fuel Injection Pump with Fitted Governor

|         | elivery on control lever np 40°C (104°F) | Control rod stop 3a | Fuel deliv   | ery characteristics 3b                                       | Starting to  | uel delivery d Contre              |
|---------|--|---------------------|--------------|--|--------------|------------------------------------|
| rev/min | cm <sup>3</sup> /-1000 strokes           | rev/min<br>3        | rev/min<br>4 | cm <sup>3</sup> /-1000 strokes<br>5                          | rev/min<br>6 | cm <sup>3</sup> /1000 strokes / mm |
| 1150    | 124,0-126,0<br>(121,5-128,5)             | •                   | 900          | 110,0-114,0<br>(107,0-117,0)<br>118,0-123,0<br>(115,0-126,0) | 100          | 140,0-160,0<br>(136,0-164,0)       |

Checking values in brackets

7.84

**BOSCH** 

eschaftsbereich KH. Kundendienst. Kfz-Ausrustung. 1980 by Robert Bosch GmbH, Postfach 50, D-7000 Stuttgart 1. Printed in the Federal Republic of Germany nprimé en République Fédérale d'Allemagne par Robert Bosch GmbH.

WPP 001/4 FIA 17,2 d

1. Edition

PE 8 P 120 A 920/5 LS 3827

ROV 300-900 PA 475-1

supersedes -

Komb.-Nr. 0 401 848 757

company: Fiat-IVECO

1-8-4-3-6-5-7-2 je  $45^{\circ} \pm 0,5^{\circ} (\pm 0,75^{\circ})$ 

8280.22.201

Values only apply to test nozzle-and-holder

assembly 1 688 901 019 and fuel-injection test

tubing 1 680 750 067
All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

309 kW

A. Fuel Injection Pump Settings
Port closing at preatroke (3, 45-3, 65)

|      |         | •            |   | 3  | • |   |
|------|---------|--------------|---|----|---|---|
| Port | closing | at prestroke | ( | (3 |   |   |
| _    |         |              |   | _  | - | ĕ |

213

141.78

E:31

mm (from BDC) DUL-Q Q 42 Q mm

| Rotational speed rev/min | Control rod<br>travel<br>mm<br>2 | Fuel delivery<br>cm <sup>3</sup> /100 strokes<br>3 | Difference<br>cm <sup>3</sup> /<br>100 strokes<br>4 | Control rod<br>travel<br>mm<br>2 | Fuel delivery<br>cm <sup>3</sup> /100 strokes<br>3 | Spring pre-tensioning<br>(torque-control valve)<br>mm<br>6 |
|--------------------------|----------------------------------|--|---|----------------------------------|--|--|
| 900                      | 13,1+0,1                         | 21,3-21,5  | 0,5(0,9)  |                                  |  |  |
| 300                      | 5,2-5,4                          | 1,3-1,9  | 0,8(1,2)  |                                  |  |  |
|                          |                                  |  |   |                                  |  |  |

Adjust the fuel delivery from each outlet according to the values in [

#### **B.** Governor Settings

| Upper rated                                    | speed                                       |   |     | Intermediate                          | rated sp     | eed                           | Lower rated   | speed                     | •                             | Slidina s     | leeve travel       |
|--|---|---|-----|---------------------------------------|--------------|-------------------------------|---|---------------------------|-------------------------------|---------------|--------------------|
| Degree of<br>deflection<br>of control<br>lever | rev/min<br>Control<br>rod travel<br>mm<br>2 | Control rod<br>travel<br>mm<br>rev/min<br>3 | (a) | Degree of deflection of control lever | røv/min<br>5 | Control rod<br>travel<br>mm 4 | Degree of<br>deflection<br>of control<br>lever<br>7 | rev/m <del>i</del> n<br>8 | Control rod<br>travel<br>mm 3 | rev/min<br>10 | 1)<br>mm<br>11     |
| max.   | 970   | 15,2-17                                     | ,8  | -                                     | -            | -                             | ca.11   |                           | min.6,8<br>6,2-5,4            | 300<br>450    | 1,6-1,7<br>3,5-4,1 |
| ca. 61   | 12,1<br>4,0<br>1200                         | 940-950<br>1045-107<br>0-1,0                | 5   |                                       |              |                               | 310-415   | 300                       | <i>D</i> ,E-0,4               |               | 7,8                |
|  |   |   |     |                                       |              |                               | <b>③</b>  |                           |                               |               |                    |

Torque control travel a

#### C. Settings for Fuel injection Pump with Fitted Governor

| Full-load of<br>Control-ro<br>Test oil ter |  | Rotational-speed (20) limitation intermediate speed | Fuel deli-<br>high idle s |  | Starting<br>Idle<br>switching |                             | Torque-<br>travel | Control rod |
|--|--|---|---------------------------|--|-------------------------------|-----------------------------|-------------------|-------------|
| rev/min                                    | cm³/1000 strokes                       | rev/min 40  | rev/min                   | cm <sup>3</sup> /1000 strokes  | rev/min                       | cm³/1000 strokes            | rev/min           | travel      |
| 1  | 2                                      | 3   | 4                         | 5  | 6                             | 7                           | 8                 | 9           |
| LDA<br>900                                 | 0,9 bar<br>213,0-215,0<br>(210,0-218,0 |   | LDA<br>550<br>LDA<br>500  | 0,9 bar<br>231,0-237,0<br>(228,0-240,0)<br>0 bar<br>129,0-131,0<br>(126,0-134,0) |                               | 170,0-190,0<br>(166,0-194,0 |                   | -           |

Checking values in brackets

\* 1 mm tess control rod travel than col. 2

## D. Adjustment Test for Manifold Pressure Compensator

Test at n =

500

rev/min decreasing pressure – in bar gauge pressure

FIA 17,2 d

- 2 -

| Pump/governor                  | Setting              | Measurement          | diminution<br>Control rod travel-<br>difference |
|--------------------------------|----------------------|----------------------|---|
|                                | Gauge pressure = bar | Gauge pressure = bar | mm (1)  |
| PE 8 PLS 3827<br>+RQV PA 475-1 | 0,90                 | 0<br>0,44<br>0,33    | 13,1-13,2<br>9,3-9,4<br>12,2-12,3<br>9,9-10,3   |

Notes

(1) when  $\pi^{-1}$ 

rev/min and gauge pressure = bar (= maximum full-load control rod travel)

## Test specifications Fuel injection pumps and governors

WPP 001/4 MTU 19,9 d 2. Edition

40

ROU 250-350/1100 ZWA 43 DR PE 6 ZW 150/120 RS 1007/11 Komb.-Nr. 0 402 436 039

Replaces ... Firm: MTU

Engine: MB 6 V 331

1 - 2 - 3 - 4 - 5 - 6  $0 - 45 - 120 - 165 - 240 - 285^{0} + 0,5^{0}$  (+0,75°)

Note VDT-W-400/305

Governor adjustement according to VDT-I-420/112

All test specifications apply only to Bosch fuel-injection pump test benches and equipment

#### A. Fuel-injection-pump settings

2,50-2,60 mm (from BDG)] Port closing at prestroke 45-2 65) Fuel delivery Spring pre-tension **Fuel delivery** Difference Control Rotational (torque-control **Checking values** valve) in fuel delivery rod travel Average value speed cm<sup>3</sup>/1000 strokes cm³/1000 strokes cm<sup>3</sup>/1000 strokes mm min 1 494,0-510,0 15,0(22,0) 18,0 497,0-507,0 1000 16,0(24,0) 126,0-156,0 131,0-151,0 9,0 600 10,0(15,0) 65,0-95,0 70,0-90,0 300 9,0

Adjust the fuel delivery from each outlet according to the values in

#### **B.** Governor settings

| Upper rated sp<br>Control<br>lever<br>deflection |                                     | Control-<br>rod<br>travel          | Medium ra<br>Control<br>lever<br>flection | ,                                 | Control-<br>rod<br>travel                       | Lower rat<br>Control<br>lever de-<br>flection |                          | Control-<br>rod<br>travel           |             | e control<br>Control-<br>rod<br>travel |
|--|-------------------------------------|------------------------------------|---|-----------------------------------|---|---|--------------------------|-------------------------------------|-------------|--|
| degrees m  | nin '                               | mm min 1                           | degrees<br>4                              | min '<br>5                        | mm<br>6   | degrees<br>7                                  | min '                    | mm<br>9                             | min '<br>10 | mm<br>11                               |
| ca. 58   | 650<br>1100<br>1150<br>1200<br>1230 | 17,5-18,0<br>13,7-16,0<br>3,0-10,0 | ca. 27                                    | 100<br>350<br>650<br>1000<br>1150 | 14,5-17,5<br>7,6-8,2<br>1,8-2,4<br>1,8-2,4<br>0 | ca.21   | 150<br>250<br>400<br>530 | 9,5-11,8<br>7,7-8,2<br>2,2-4,5<br>0 | -           | -                                      |

Torque control travel a =

Speed regulation: At 1130-1140 m1mmless control rod travel

### C. Settings for fuel-injection pump with fitted governor

| on gove | d delivery<br>ernor control lever<br>temperature 40°) | Control rod stop at speed | Fuel-de<br>charact |                       | Starting fuel delivery |  |  |
|---------|---|---------------------------|--------------------|-----------------------|------------------------|--|--|
| min '   | cm <sup>1</sup> /1000 strokes<br>2                    | min ' Leerlauf            | min ¹<br>4         | cm³/1000 strokes<br>5 | min '                  | cm³/1000 strokes<br>7                                |  |
| 1100    | 18 mm RW  | 390<br>= 8,0 mm RW        | -                  | •                     | 100                    | 18,0-18,2 mm RW                                      |  |
|         |   | 2 0,0 min NW              |                    |                       |                        | Shutoff solenoid<br>0,5 - 1,5 mm in<br>front of stop |  |

Checking values in brackets

05.84

## **Test specifications** Fuel injection pumps and governors

WPP 001/4 MTU 31.7 e 3. Edition

RQU 750 ZWA 57 R PE 8 ZW 160/120 RS 1013/11

Kcmb.- Nr. 0 402 438 C18 1-2-6-3-4-5-7-8 je  $45^{\circ} \pm 0.5^{\circ} (\pm 0.75^{\circ})$ 

Replace 03.84 MTU

Engine: MT 8 V 396

Note VDT-W-Gen./7

All test specifications apply only to Bosch fuel-injection pump test benches and equipment

### A. Fuel-injection-pump settings

mm (from BDØv1

| Rotational | Control-   | Fuel delivery                 | Difference                    | Fuel delivery                 | Spring pre-tension (torque-control |
|------------|------------|-------------------------------|-------------------------------|-------------------------------|------------------------------------|
| speed      | rod travel | Average value                 | in fuel delivery              | Checking values               | valve)                             |
| min '      | mm         | cm <sup>3</sup> /1000 strokes | cm <sup>3</sup> /1000 strokes | cm <sup>3</sup> /1000 strokes |                                    |
| 1          | 2          | 3                             | 4                             | 5                             |                                    |
| 600        | 18,0       | 513,0-523,0                   | 16,0(24,0)                    | 510,0-526,0                   |                                    |
| 600        | 9,0        | 140,0-160,0                   | 12,0(18,0)                    | 135,0-165,0                   |                                    |
| 300        | 9,0        | 72,0-92,0                     | 11,0(16,0)                    | 67,0-97,0                     |                                    |
|            | -          |                               |                               |                               |                                    |
|            |            |                               |                               |                               |                                    |
|            |            | 1                             |                               | I                             |                                    |

Adjust the fuel delivery from each outlet according to the values in  $\hat{\mathbf{L}}$ 

#### **B.** Governor settings

Sleeve position 49,5 mm

| Upper rated<br>Control<br>lever<br>deflection<br>degrees<br>1 | mm<br>min '                            | Control-<br>rod<br>travel<br>mm min '                      | Medium ra<br>Control<br>lever<br>flection<br>degrees<br>4 | ted spec<br>min 1<br>5 | ed<br> Control-<br> rod<br> travel<br> mm<br> 6 | Lower rat<br>Control :<br>lever de-<br>flection<br>degrees<br>7 |   | d<br>Control-<br>rod<br>travei<br>mm<br>9 |   | e control<br>Control-<br>rod<br>travel<br>mm |
|---|--|--|---|------------------------|---|---|---|---|---|--|
| ca. 52  | 750<br>720<br>750<br>770<br>780<br>800 | 18,0<br>25,6-30,6<br>17,0-19,0<br>6,8-11,8<br>0,5-8,0<br>0 | •   | -                      | -   | -   | • | œ   | - | -  |

Torque control travel a =

Speed regulation: At 760-765 min-m less control rod travel

### C. Settings for fuel-injection pump with fitted governor

| on gove | d delivery<br>ernor control lever<br>I temperature 40°) | Control rod stop at speed | Fuel-de<br>charact |                       | Startin<br>deliver |                       |
|---------|---|---------------------------|--------------------|-----------------------|--------------------|-----------------------|
| min '   | cm³/1000 strokes<br>2                                   | min 'Leerlaufanschl       | min ¹              | cm³/1000 strokes<br>5 | min '<br>6         | cm³/1000 strokes<br>7 |
| 750     | 18 mm RW  | 12 mai RW                 | •                  | -                     |                    | -                     |

Checking values in brackets

06.84

4

## Test specifications Fuel injection pumps and governors

WPP 001/4 MTU 29,9 a

11. Edition

Replaces 12:83

PE 8 ZWM 140/120 RS 19/11 Komb.-Nr. 0 406 038 019

RQU 375/1100 ZWA 25 DR

Engine: MB 837 A a

1 - 2 - 6 - 3 - 4 - 5 - 7 - 8 ie  $45^{\circ} \div 0.5^{\circ}$  ( $\div 0.75^{\circ}$ ) Note VDT-W-Gen./7

Governor adjustement according to VDI-I-420/112
All test specifications apply only to Bosch fuel-injection pump test benches and equipment

A. Fuel-injection-pump settings

mm (from BDC) Zy1. 8 Port closing at prestroke (1,95-2,15)Spring pre-tension **Fuel delivery** Difference **Fuel delivery** Control-Rotational (torque-control valve) Checking values in fuel delivery Average value rod travel speed cm<sup>3</sup>/1000 strokes cm<sup>3</sup>/1000 strokes cm<sup>3</sup>/1000 strokes mm min 1 18,0 373,0-378,0 11,0 (16,0) 370,0-381,0 600 14,0 (21,0) 143,0-163,0 138,0- 168,0 600 14,0 (21,0) 8,0 (12,0) 66,0-96,0 71,0-91,0 9,0 200 C. Sp. 2 1080 C, Sp. 2 380 8,0

Adjust the fuel delivery from each outlet according to the values in

#### **B.** Governor settings

| 1130 15,0- | 24 0                                  |              |         |                          |   |                     |  |
|------------|---------------------------------------|--------------|---------|--------------------------|---|---------------------|--|
|            | -19,5<br>-18,0<br>-12,4<br>7,8<br>1,0 | 1100<br>1180 | 0,4-1,6 | 250<br>375<br>500<br>900 | 12,0-14,0<br>10,4-12,4<br>5,6-6,0<br>2,3-3,1<br>1,1-2,0 | 700<br>1000<br>1100 | 21,7-22,<br>20,9-21,<br>19,5-20,<br>19,0-19, |

Torque control travel a = C. Settings for fuel-injection pump with fitted governor

| on gove | load delivery Centrol red stop  available 12 (2015)  Centrol red stop  available 12 (2015) |                       | Fuel-delivery<br>characteristics |  | Starting fuelli-<br>delivery |   |  |
|---------|--|-----------------------|----------------------------------|--|------------------------------|---|--|
| min 1   | cm <sup>1</sup> /1000 strokes  | min <sup>1</sup><br>3 | min ¹<br>4                       | cm³/1000 strokes<br>5  | min '<br>6                   | cm <sup>3</sup> /1000 strokes<br>7                  |  |
| 1080    | 232,0-236,0<br>(229,0-239,0)   | 1220 RW max. 5 mm     | 900<br>700<br>500                | 228,0-236,0<br>(224,0-240,0)<br>228,0-236,0<br>(224,0-240,0)<br>216,0-224,0<br>(212,0-228,0) | 375                          | 18,0-18,2 mm<br>RW<br>Butée de ralenti<br>53,0-58,0 |  |

Checking values in brackets

06.84

67

Limit the quantity at the exess-fuel stop.

## **Test Specifications** Fuel Injection Pumps (A) and Governors

WPP 001/4 KHD 13,8 b

1. Edition

En

PE 6 P 100/420 LS 89

RSV 250-1000 P 7/312 R

supersede 5 company KHD

Komb.-Nr. 0 401 876 058

engine F6 M 716

Note VDT-I-401/ 103

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

#### A. Fuel Injection Pump Settings

Port closing at prestroke

Testoil-150

2,0-2,1 (1.95-2.15)

mm (from BDC)

| Rotational<br>speed<br>rev/min | Control rod travel         | Fuel delivery<br>cm <sup>1</sup> /100 strokes<br>3 | Difference<br>cm <sup>-/</sup><br>100 strokes<br>4 | Control rod<br>travel<br>mm<br>2 | Fuel delivery<br>cm <sup>-/</sup> 100 strokes<br>3 | Spring pre-tensioning<br>(torque-control valve)<br>mm |
|--------------------------------|----------------------------|--|--|----------------------------------|--|---|
| 1000                           | 12,0                       | 12,4-13,2  | 0,5  |                                  |  |   |
| 600<br>600<br>600<br>200       | 9,0<br>12,0<br>15,0<br>9,0 | 5,4-6,4<br>11,4-12,7<br>17,5-18,8<br>3,6-4,6       |  |                                  |  |   |

Adjust the fuel delivery from each outlet according to the values in

#### **B. Governor Settings**

|        | r rated speed<br>Control rod<br>travel<br>mm | rev/min<br>  Control rod<br>  travel<br>  mm rev/min<br>  3 | Intermed | tiate rated | speed | Control-<br>lever<br>deflection<br>in degrees<br>7 |                   | rated speed<br>Control rod<br>travel<br>mm | 1 3 /             | rque control<br>Control rod<br>travel<br>mm |
|--------|--|---|----------|-------------|-------|--|-------------------|--|-------------------|---|
| ca. 68 | 1000<br>1050<br>1080                         | 16,0<br>9,0<br>4,0  | witho    | ut aux      | iliar | ca. 28<br>v spring                                 | 300<br>100<br>300 | 6,0<br>19-21<br>5,7-6,3                    | 980<br>450<br>340 | 0<br>0<br>1,2-1,8                           |
| 29     | 1050<br>1100<br>1180                         | 7,0-10,0<br>1,5-3,8<br>0-1,0                                | with     | auxili      | ary s | pring  | 350<br>450        | 3,2-4,5<br>0-1,0                           |                   |   |

The numbers denote the sequence of the tests

### C. Settings for Fuel Injection Pump with Fitted Governor

|      | emp_40°C (104°F) | Rotational-<br>speed limitat<br>Note<br>changed to )<br>rev/min<br>3 | el delivery<br>aracteristics<br>cm/1000 strokes | Starting fi<br>Idle<br>rev/min<br>6 | cm <sup>3</sup> /1000 strokes | • | Control rod<br>travet<br>mm |
|------|------------------|--|---|-------------------------------------|-------------------------------|---|-----------------------------|
| Take | from VDT-I-401/  | 103  | ·   | -                                   | -                             | - | -                           |
|      |                  |  |   |                                     |                               |   |                             |

Checking values in brackets

\* 1 mm less control rod travel than col 2

6.84

ch KM-Kundendienst-Kfz-Ausrustung rir Bosch GmbH. Postlach SO. D-7000 Stuttgart t-Printed in the Federal Republic of Germany ublique Fédérale d'Allemagne par Robert Bosch GmbH

WPP 001/4 IHC 3,9a 9

4 · Edition

600

En

VA 4/100 H 1050 BR 12

BR 12 0 460 304 048 BR 12-3 · 0 460 304 049

BR 12-7 0 460 304 142

supersede6 . 82 company IHC

DHK:1 688 901 020

Testoil-ISO 4113

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers Test Intructions and Test Equipment

830-980

VDT-WPP 161/4 B

Pre-setting see reverse side

0,5 Setting of the pointer at a stroke of 1 mm in relation to outlet "A".

2. Test Specifications Checking values in brackets
1. Timing device rev/min 150-300

| 1. Settings   | rev/min | Settings  |                               | Charge-air press<br>kp/cm² | Difference in delivery cm <sup>3</sup> |
|---|---------|-----------|-------------------------------|----------------------------|--|
| 1 1 Timing device travel                                  | 600     | 8,1-9,1   | mm                            |                            |  |
| 1.2 Supply pump pressure                                  | 600     | 4,5-5,0   | kp/cm²                        |                            |  |
| t 3 Full load delivery without                            | 800     | 64,0-65,0 | cm <sup>3</sup> /1000 strokes |                            | 2,5                                    |
| charge air pressure<br>Fuli load delivery with charge air |         |           | cm <sup>3</sup> /1000 strokes |                            |  |
| pressure 1.4. Idle speed regulation                       | 250     | 17,5-23,5 | cm <sup>1</sup> /1000 strokes |                            | 3,0                                    |
| 1 5 Start   | 100     | mind. 85  | cm³/1000 strokes              |                            |  |
| 1.6 Full load speed regulation                            | 1100    | 41,0-49,0 | cm <sup>3</sup> /1000 strokes |                            |  |

| 1 Timing device     | rev/min                       | 150-300                    |                               | (7.0.0.4)  | 12 7-11 11 (12 11-11 7                 |
|---------------------|-------------------------------|----------------------------|-------------------------------|--|--|
|                     | mm                            | Beginn                     |                               | (7,8-9,4)  | 13,7-14,4 (13,4-14,7)                  |
| 2 2 Supply pump     | rev/min<br>kp/cm <sup>2</sup> | 100<br>1,6-2,1 (1,4        | 1-2,3)                        | 600<br>(4,2-5,2)   | 1050<br>6,2-6,7 (6,0-6,9)              |
| Overflow delivery   | rev/min<br>cm³/10 s           | 500<br>mind. 25            |                               |  | 1000<br>55-125 (40-140)                |
| 23 Fuel deliveries  |                               |                            |                               |  |  |
| Speed control lever | Delivery lever                | rev/min                    | cm <sup>3</sup> /1000 strokes | <b>,</b>   | Charge air pressure kp/cm <sup>-</sup> |
| End stop            | Full                          | 1110-1160                  | 0                             |  |  |
|                     |                               | 1100<br>1030<br>800<br>500 |                               | (40,0-50,0)<br>(65,0-70,0)<br>(63,5-65,5)<br>(56,0-61,0) | ·                                      |
|                     | Stop                          | 1050                       | 0                             |  |  |
| Idle stop           | Full                          | 310-360                    | 0                             |  |  |

mind. 85

250

100

mind. 150

End stop

Start

(16,5-24,5)

8.84

| Angle to the stop-plate                                  | Pre-setting dimensions   |
|--|--|
| Pump  " = 25 ± 4°  B = 40 ± 8°  1 = 30 - 8°  2 = 60 ± 8° | Pump  Dimension IV = 0,5 mm  Dimension V = - mm  Maß 1 = 7,0 mm  Maß 11 = 14,0 mm  Maß 111 = 35,8 mm |

46

WPP 001/4 IHC 3,5 e 6

1. Edition

43

VA 4/100 H 1200 CR 12-11 0 460 304 204 DHK: 1 688 901 020

supersedes IHC COMPANY D 206 engine

Pre stroke setting 0,5 mm ± 0,02(0,04)
Setting of the pointer at a stroke of 1 mm in relation to outlet "A".

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers Test Intructions and Test Equipment VDT-WPP 161/4 B

Pre-setting see reverse side

| 1. Settings  | rev/min | Settings  |                               | Charge-air press<br>kp/cm <sup>2</sup> | Difference in delivery cm <sup>3</sup> |
|--|---------|-----------|-------------------------------|--|--|
| 1.1 Timing device travel                               | 800     | 2,5-3,5   | mm                            |  |  |
| 1.2 Supply pump pressure                               | 800     | 4,5-5,0   | kp/cm²                        |  |  |
| 1.3 Full load delivery without                         | 800     | 61,5-62,5 | cm³/1000 strokes              |  |  |
| charge air pressure Full load delivery with charge air | -       |           | cm³/1000 strokes              |  |  |
| pressure 1.4 Idle speed regulation                     | 370     | 12,0-18,0 | cm³/1000 strokes              |  |  |
| 1.5 Start  | 100     | min. 90   | cm³/1000 strokes              |  |  |
| 1.6 Full Iriard speed regulation                       | 1300    | 21,0-29,0 | cm <sup>1</sup> /1000 strokes |  |  |

| 2. Test Sp        | rev/min  | 1250-500  | 0 0-1 90 | 0 6-2 2) | 800<br>(2.2-3.8) | 1020-1170<br>4,7-5,4(4,4-5,7)            |
|-------------------|----------|-----------|----------|----------|------------------|--|
|                   | mm       | pegriiii  | 0,3-1,3( | 0,0-2,27 | (2,2-0,0)        | 4,,, 0,,(,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,, |
| 2 2 Supply pump   | rev/min  | 200       |          | 800      | 0)               | 1200                                     |
| ,,,,,,            | kp/cm    | 1,4-1,9(1 | 1,2-2,1) | (4,3-5,  | 2) 6,1-6         | 6,6(5,9-6,8)                             |
| Overflow delivery | rey/min  | 500       |          |          |                  | 1200                                     |
| Overnow dentery   | cm'/10 s | 55-100(40 | 0-110)   |          | 55-10            | 00(40-110)                               |

| 23 | Fuel | deliverie | 5 |
|----|------|-----------|---|

| Speed control lever | Delivery lever | rev/min        | cm 11000 strokes  | Charge air pressure kp/cm <sup>2</sup> |
|---------------------|----------------|----------------|-------------------|--|
| End stop            | Full           | 1330-1380      | 0                 |  |
|                     |                | 1300           | 21,0-29,0 (20,0-3 | 0,0)                                   |
|                     |                | 1170           | 66,5-69,5 (65,5-7 | 0,5)                                   |
|                     |                | 800            | (60,0-6           | 3,0)                                   |
|                     |                | 500            | 54,5-57,5 (53,5-5 | 8,5)                                   |
|                     | Stop           | 1200           | 0                 |  |
| Idle stop           | Full           | 420-500        | 0                 |  |
|                     |                | 370            | (11,0-1           | 9,0)                                   |
|                     | Start          | 100<br>220-300 | min. 90           |  |

| Angle to the stop plate                                  | Pre-setting dimensions                       |
|--|--|
| Pump  " = 25 ± 4°  B = 40 ± 8°  " = 30 - 8°  " = 60 + 8° | Pump Dimension ♥ 2.0 mm Dimension ♥ 24,65 mm |

WPP 001/4 IHC 5,8m 1

2. Edition

**Setoll-ISO 4113** 

VA 6/10 H 1100 CR 87-2 0 460 306 248

DHK 1 688 901 020 / 172+3 bar

supersed 10.79 companyHC engine D 358

All test specifications are valid for -**Bosch Fuel Injection Pump Test Benches** and Testers Test Intructions and Test Equipment **VDT WPP 161/4 B** Pre-setting see reverse side

Setting of the pointer at a stroke of 1 mm in relation to outlet "A".

| 1. Settings  | rev/min | Settings    |                               | Charge air press<br>kp/cm | Difference in deliver |
|--|---------|-------------|-------------------------------|---------------------------|-----------------------|
| f 1 Timing device travel                           | 700     | 3,8-4,6     | mm                            |                           |                       |
| 1 2 Supply pump pressure                           | 700     | 4,8-5,3     | kp/cm²                        |                           |                       |
| 1.3 Full load delivery without charge air pressure | 800     | 67,5-68,5   | cm <sup>3</sup> /1000 strokes |                           | 2,5                   |
| Full load delivery with charge air pressure        |         |             | cm <sup>1</sup> /1000 strokes |                           |                       |
| t 4 Idle speed regulation                          | 400     | 9,5-15,5    | cm³/1000 strakes              | 1                         | 3,0                   |
| 1 5 Start 196 bar                                  | 100     | mind. 80, 0 | cm³/1000 strokes              |                           |                       |
| 1.6 Full-load speed regulation                     | 1150    | 33,5-41,5   | cm <sup>1</sup> /1000 strokes |                           |                       |

| 1 Timing device   | rev/min               | 400               | 700       | 800-950           |
|-------------------|-----------------------|-------------------|-----------|-------------------|
|                   | mm                    | 0,8-1,8 (0,5-2,1) | (3,5-4,9) | 5,2-5,9 (4,9-6,2) |
| 2 2 Supply pump   | rev/min               | 200               | 700       | 1100              |
|                   | kp/cm <sup>-/</sup>   | 2,2-2,7 (2,0-2,9) | (4,6-5,5) | 6,2-6,7 (6,0-6,9) |
| Overflow delivery | rev/min               | 500               |           | 1100              |
|                   | cm <sup>1</sup> /10 s | 55-100 (40-110)   |           | 55-100 (40-110)   |

| 23 | ruei deliveries |             |             |        |
|----|-----------------|-------------|-------------|--------|
| _  |                 | Inches town | Lancetonion | lom341 |

| Speed control lever | Delivery lever | rev/min  | cm³/1000 strokes  | Charge-air pressure kp/cm² |
|---------------------|----------------|--|---|----------------------------|
| End stop            | Full           | 1190-1240<br>(1170-1260)<br>1150<br>1050<br>800<br>500 | 0<br>(32,5-42,5<br>68,0-71,0 (67,0-72,6<br>(67,0-69,6<br>66,0-70,0 (65,0-71,6 | D)<br>D)                   |
|                     | Stop           | 1100   | 0   |                            |
| idle stop           | Fult           | 480-530<br>(460-550)<br>400                            | 0 (8,5-16,5)  |                            |
|                     | Start          | 100  | mind. 80, 0   |                            |
| End stop            |                | 220-320  |   |                            |

| Angle to the stop-plate                              | Pre-setting dimensions                 |
|--|--|
| Pump " = 25 ± 4° " = 40 ± 8° " = 30 - 8° " = 60 ± 8° | Pump Dimension IV = 3,00 mm = 24,65 mm |

WPP 001/4 IHC 4,4 p 1. Edition

En

S145 OS 403

VA 4/11 H 1200 CR 93-3 0 460 314 047 048 DHK: 1 688 901 020

supersedes companyIHC engine D 268

Setting of the pointer at a stroke of 1 mm in relation to outlet "A".

2. Test Specifications Checking values in brackets

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers Test Intructions and Test Equipment VDT-WPP 161/4 B

| elation to outlet "A".                             |         |           | Pr                            | e-setting see revers                   | se side                    |
|--|---------|-----------|-------------------------------|--|----------------------------|
| 1. Settings  | rev/min | Settings  |                               | Charge-air press<br>kp/cm <sup>2</sup> | Difference in delivery cm' |
| 1 1 Timing device travel                           | 700     | 5,0-5,8   | mm                            |  |                            |
| 1.2 Supply pump pressure                           | 700     | 4,7-5,2   | kp/cm²                        | i i                                    |                            |
| 1.3 Full load delivery without charge air pressure | 800     | 80,0-81,0 | cm <sup>3</sup> /1000 strokes |  | 3,0                        |
| Full load delivery with charge-air                 | -       |           | cm <sup>3</sup> /1000 strokes |  |                            |
| pressure 1.4 lidle speed regulation                | 350     | 14,0-20,0 | cm³/1000 strokes              |  | 3,0                        |
| 1.5 Start  | 100     | min. 95   | cm³/1000 strokes              |  |                            |
| 1.6 Full load speed regulation                     | 1250    | 41,0-49,0 | cm³/1000 strokes              |  |                            |

| ? 1 Timing device   | rev/min<br>mm       | 0,7-1,7(0,4        | -2,0)                | (4,7       | 700<br>7-6,1) | 6,1-  | 800<br>6,8(5,8-7,1)                    |
|---------------------|---------------------|--------------------|----------------------|------------|---------------|-------|--|
| 2.2. Supply pump    | rev/min<br>kp/cm    | 200<br>1,7-2,2(1,5 | -2,4)                | (4,5       | (00<br>5-5,4) | 6,3-  | 1100<br>6,8(6,1-7,0)                   |
| Overflow delivery   | rev/min<br>cm*/10 s | 500<br>55-100(40-  | 110)                 | -          | 120<br>55-100 |       | 0)                                     |
| 2.3 Fuel deliveries | Delivery lever      | rev/min            | lem <sup>1</sup> /10 | 00 strokes |               |       | Charge-air pressure kp/cm <sup>-</sup> |
| Speed control lever | Full                | 1290-1350          | 0                    |            |               |       |  |
| Cint Step           |                     | 1250               |                      |            | (40,0-        | 50,0) |  |
|                     |                     | 1100               | <b>85,0-</b>         | 88,0       | (84,0-        |       |  |
|                     |                     | 800                |                      |            | (79,5-        | 81,5) |  |
|                     |                     | 500                | 78,5-                | 81,5       | (77,5-        | 82,5) |  |
|                     | Stop                | 1200               | 0                    |            |               |       |  |
| tdle stop           | Full                | 420-470            | •                    | <u> </u>   | <del></del>   |       |  |
|                     |                     | 350                |                      |            | (13,0-        | 21,0) |  |
|                     | Start               | 100<br>220-340     | nin.                 | 95         |               |       |  |

| Angle to the stop-plate                                  | Pre-setting dimensions                       |
|--|--|
| Pump  " = 25 ± 4°  B = 36 ± 8°  1 = 30 - 8°  2 = 60 + 8° | Pump Dimension ▼ 1,6 mm Dimension ♥ 24,65 mm |

46

WPP 001/4 SAV 5,2 a 6

2. Edition

6214 OOMO 66

VA 6/100 H 1450 CR 124-3 0 460 306 139

supersedes company Saviem 797-10 LKW SM 8 T

Setting of the pointer at a stroke of 0,3 mm in relation to outlet "A".

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers Test Intructions and Test Equipment VDT-WPP 161/4 B Pre-setting see reverse side

| 1. Settings  | rev/min | Settings  |                               | Charge air press<br>kp/cm <sup>2</sup> | Difference in delivery |
|--|---------|-----------|-------------------------------|--|------------------------|
| 1 1 Timing device travel                             | 1100    | 3,9-4,7   | mm                            |  |                        |
| 1.2 Supply pump pressure                             | 1100    | 5,9-6,4   | kp/cm²                        |  |                        |
| 1.3 Full load delivery without                       | 900     | 59,5-60,5 | cm³/1000 strokes              |  | 3,0                    |
| charge air pressure Full load delivery with charge a |         | -         | cm <sup>3</sup> /1000 strokes |  |                        |
| pressure  1.4 Idle speed regulation                  | 300     | 7,0-13,0  | cm³/1000 strokes              |  | 2,5                    |
| 1.5 Start  | 100     | mind.80,0 | cm³/1000 strokes              |  |                        |
| 1.6 Full load speed regulation                       | 1600    | 13,0-19,0 | cm <sup>1</sup> /1000 strokes |  |                        |

| Z. 16SL Sp<br>21 Timing device | ecificatio                       | 0,4-1,4(0,2                                     | ues in bracket | 1100                     | 1450<br>) 7,0-7,7(6,6-8, | 0)                 |
|--------------------------------|----------------------------------|---|----------------|--------------------------|--------------------------|--------------------|
| 2.2 Supply pump                | rev/min                          | 200<br>1,3-1,8(1,1                              | -2,0)          | 1100<br>(5,7-6,6         | 1450<br>) 7,3-7,8(7,1-8, | 0)                 |
| Overflow delivery              | rev/min<br>cm <sup>1</sup> /10 s | 500<br>55-100(40-1                              | 10)            |                          | 1450<br>55-100(40-110    | ))                 |
| 23 Fuel deliveries             |                                  |   |                |                          |                          |                    |
| Speed control lever            | Delivery lever                   | rev/min   | cm 1/1000      | strokes                  | Charge air pressure      | kp/cm <sup>2</sup> |
| End stop                       | Fuil                             | 1600-1700<br>1600<br>1500<br>1400<br>900<br>500 |                | 59,0 (52,0<br>52,0 (58,0 | -61,0)                   |                    |
|                                | Stop                             | 1400  | 0              |                          |                          |                    |
| Idle stop                      | Full                             | 350-450<br>300                                  | 0              | (6,0                     | )-14,0)                  |                    |
| End stop                       | Start                            | 100<br>150-250                                  | mind.          | 0,08                     |                          |                    |

| Angle to the stop-plate                              | Pre-setting dimensions                        |
|--|---|
| Pump " = 25 + 4° " = 55 + 8° " = 30 - 8° " = 60 + 8° | Pump Dimension v= 5,6 mm Dimension v= 24,6 mm |

46

WPP 001/4 STE 4,0e

4. Edition

VA 4/90 H 1200 CR 144-2 0 460 394 042 supersedes companySteyr
engine WD 411.41

Pre-setting see reverse side

Pre-stroke setting

 $0.3_{mm} \pm 0.02 (\pm 0.04)$ 

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers Test Intructions and Test Equipment VDT-WPP 161/4 B

| 1. Settings  | rev/min | Settings    |                               | Charge-air press<br>kp/cm <sup>2</sup> | Difference in delivery |
|--|---------|-------------|-------------------------------|--|------------------------|
| 1 1 Timing device travel                           | 1000    | 3,9-4,7     | mm                            | •                                      |                        |
| 1.2 Supply pump pressure                           | 1000    | 5,1-5,6     | kp/cm <sup>2</sup>            |  |                        |
| 1.3 Full load delivery without charge air pressure | 900     | 55, 5-57, 5 | cm <sup>1</sup> /1000 strokes |  | 2,5                    |
| Full load delivery with charge-air pressure        |         |             | cm <sup>3</sup> /1000 strokes |  |                        |
| 1.4 Idle speed regulation                          | 300     | 13,0-19,0   | cm <sup>3</sup> /1000 strokes |  | 3,0                    |
| 1.5 Start  | 100     | mind. 70, 0 | cm³/1000 strokes              |  |                        |
| 1.6 Full load speed regulation                     | 1280    | 23,0-31,0   | cm <sup>1</sup> /1000 strokes |  |                        |

| 2. Test Sp        | ecificat           | ions Checking values in bracket | s         | 4000             |
|-------------------|--------------------|---------------------------------|-----------|------------------|
| 2.1 Timing device | rev/min            | 700                             | 1000      | 1200             |
| -                 | mm                 | 0,8-1,8(0,5-2,1)                | (3,6-5,0) | 5,8-6,6(5,5-6,9) |
| 2.2 Supply nump   | rev/min            | 200                             | 1000      | 1200             |
|                   | kp/cm <sup>2</sup> | 1,2-1,7(1,0-1,9)                | (4,9-5,8) | 6,0-6,5(5,8-6,7) |
| Overflow delivery | rev/min            | 500                             |           | 1200             |
|                   | cm 1/10 s          | 55-100(40-110)                  |           | 55-100(40-110)   |

| 23 | Fuel | deliveries |  |
|----|------|------------|--|

| Speed control lever | Delivery lever | rev/min                    | cm 1/1000 strokes | •  | Charge-air pressure kp/cm <sup>-</sup> |
|---------------------|----------------|----------------------------|-------------------|--|--|
| End stop            | Full           | 1330-1380                  | 0                 |  |  |
|                     |                | 1280<br>1150<br>900<br>500 |                   | (22,0-32,0)<br>(59,0-61,0)<br>(54,5-58,5)<br>(47,5-52,5) |  |
|                     | Stop           | 1200                       | 0                 |  |  |
| Idle stop           | Full           | 420-470                    | 0                 |  |  |
|                     |                | 300                        |                   | (12,0-20,0)  |  |
|                     | Start          | 100                        | mind. 70, 0       |  |  |
| End stop            |                | 170-250                    |                   |  |  |

| Angle to the stop-plate                                  | Pre-setting dimensions                           |  |  |
|--|--|--|--|
| Pump  " = 25 ± 4°  " = 45 ± 8°  " = 30 - 8°  " = 60 + 8° | Pump Dimension IV= 4,60 mm Dimension V= 24,65 mm |  |  |

WPP 001/4 STE 3,1a

3. Edition

En

estation - 613

VA 4/100 H 1200 CR 145-4 0 460 304 237

supersedes

companySteyr
engine WD 408.43

Pre stroke setting

 $0.3 \text{ mm} \pm 0.02 (\pm 0.04)$ 

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers Test intructions and Test Equipment VDT-WPP 161/4 B

Pre-setting see reverse side

| 1. Settings  | rev/min | Settings  |                               | Charge air press<br>kp/cm <sup>2</sup> | Difference in delivery cm ' |
|--|---------|-----------|-------------------------------|--|-----------------------------|
| 1.1 Timing device travel                           | 1000    | 3, 4-4, 2 | mm                            |  |                             |
| 1.2 Supply pump pressure                           | 1000    | 4,7-5,2   | kp/cm²                        |  |                             |
| 1.3 Full load delivery without charge air pressure | 1180    | 65,0-66,0 | cm³/1000 strokes              |  | 2,5                         |
| Full load delivery with charge air                 |         |           | cm <sup>3</sup> /1000 strokes |  |                             |
| pressure 1.4. lifte speed regulation               | 250     | 12,0-18,0 | cm³/1000 strokes              |  | 3,0                         |
| 1.5 Start  | 100     | mind.80,0 | cm³/1000 strokes              |  |                             |
| 1.6. Full load speed regulation                    | 1270    | 36,0-44,0 | cm <sup>3</sup> /1000 strokes |  |                             |

| 2. Test Sp        | rev/min | (1005 Checking values in brackets<br>[480-630(450-660) | 1000              | 1140-1300                |
|-------------------|---------|--|-------------------|--------------------------|
|                   | mm      | Beginn   | (3,1-4,5)         | 5,1-5,8(4,8-6,1)         |
| 2.2 Supply pump   | rev/min | 200<br>1,2-1,7(1,0-1,9)                                | 1000<br>(4,5-5,4) | 1200<br>5,5-6,0(5,3-6,2) |
| Overflow delivery | rev/min | 500<br>55-100(40-110)                                  |                   | 1200<br>55-100(40-110)   |

| 2 | 3  | Fuel | deliverie | e |
|---|----|------|-----------|---|
| - | ., | · uc | ()Curelie | 3 |

| Speed control lever | Delivery lever | rev/min   | cm <sup>3</sup> /1000 strokes |               | Charge air pressure kp/cm <sup>2</sup> |
|---------------------|----------------|-----------|-------------------------------|---------------|--|
| End stop            | Full           | 1320-1370 | 0                             |               |  |
|                     |                | 1270      |                               | (35,0-45,0)   |  |
|                     |                | 1180      |                               | (64,5-66,5)   |  |
|                     |                | 900       | 69,0-71,0                     | (68, 0-72, 0) |  |
|                     |                | 500       | 62,0-65,0                     | (61,0-66,0)   |  |
|                     | Slop           | 1200      | 0                             |               |  |
| idle stop           | Full           | 330-380   | 0                             |               |  |
|                     |                | 250       |                               | (11,0-19,0)   |  |
|                     | Start          | 100       | mind. 80, 0                   |               |  |
| End stop            |                | 170-250   |                               |               |  |

| Angle to the stop plate   | Pre-setting dimensions .                       |
|---|--|
| Pump  " = $25 \pm 4^{\circ}$ B = $40 \pm 8^{\circ}$ The image is a second of the | Pump Dimension 1♥ 3,40 mm Dimension v 24,65 mm |

WPP 001/4 STE 4,0d

4. Edition

En

VA 4/10 H
0 460 304 2

Pre stroke setting

VA 4/10 H 1200 CR 145-5 0 460 304 246

supersedes = companySteyr engine WD 411.85

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers Test Intructions and Test Equipment VDT WPP 161/4 B

Pre setting see reverse side

 $_{\text{ting}}$  0,3  $_{\text{mm}} \pm 0.02 (\pm 0.04)$ 

| 1. Settings  | rev/min | Sellings    |                   | Charge air press<br>kp/cm | Difference in delivery cm ' |
|--|---------|-------------|-------------------|---------------------------|-----------------------------|
| 1 1 Timing device travel                           | 1000    | 5,7-6,5     | mm                |                           |                             |
| 1 2 Supply pump pressure                           | 1000    | 5,0-5,5     | kp/cm²            |                           |                             |
| 1.3 Full toad delivery without charge air pressure | 1180    | 68,0-69,0   | cm³/1000 strokes  |                           | 2,5                         |
| Full load delivery with charge air                 |         |             | cm 1/1000 strokes |                           |                             |
| pressure 1.4 Idle speed regulation                 | 350     | 10,0-16,0   | cm 1/1000 strokes | <u> </u>                  | 3,0                         |
| 15 Start   | 100     | mind. 70, 0 | cm 1/1000 strokes |                           |                             |
| 1.6 Full load speed regulation                     | 1280    | 31,0-39,0   | cm 1/1000 strokes |                           |                             |

| 2. Test Sp        | ecificat              | ions Checking values in brackets |           | 1200             |
|-------------------|-----------------------|----------------------------------|-----------|------------------|
| 2.1 Timing device | rev/min               | į <b>600</b>                     | 1000      | 1200             |
|                   | mm                    | 1,4-2,2(1,1-2,5)                 | (5,4-6,8) | 7,7-8,4(7,3-8,7) |
| 2.2 Supply nump   | rev/min               | 200                              | 1000      | 1200             |
|                   | kp/cm                 | 1,1-1,6(0,9-1,8)                 | (4,8-5,7) | 5,8-6,3(5,6-6,5) |
| Overflow delivery | rev/min               | 500                              |           | 1200             |
|                   | cm <sup>1</sup> /10 s | 55-100(40-110)                   |           | 55-100(40-110)   |

2.3 Fuel deliveries

| Speed control lever | Delivery lever | rev/min                     | cm <sup>3</sup> /1000 strokes | 5  | Charge air pressure kp/cm <sup>2</sup> |
|---------------------|----------------|-----------------------------|-------------------------------|--|--|
| End step            | Full           | 1330-1380                   | 0                             |  |  |
|                     |                | 1280<br>1180<br>1000<br>500 | 71,5-73,5<br>62,5-65,5        | (30,0-40,0)<br>(67,5-69,5)<br>(70,5-74,5)<br>(61,5-66,5) |  |
|                     | Stop           | 1200                        | o                             |  |  |
| Idle stop           | Full           | 470-530                     | 0                             |  |  |
|                     |                | 350                         |                               | (9,0-17,0)   |  |
|                     | Start          | 100                         | mind. 70, 0                   |  |  |
| End stop            |                | 170-250                     |                               |  |  |

| Angle to the stop-plate                              | Pre-setting dimensions                           |
|--|--|
| Pump " = 25 ± 4° " = 36 ± 8° " = 30 - 8° " = 60 + 8° | Pump Dimension IV= 4,00 mm Dimension V= 24,65 mm |

WPP 001/4 PEU 2,1 d

3. Edition

EP/VA 4/90 H 2250 CR 173 (Z)

173 - 1 (Z) 173 - 2 (Z)

supersedes 4.78 Peugeot company

engine

Quiet-running device (see VDT-WPP 161/4, Suppl. 1)

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

XD 4/90

Test Intructions and Test Equipment VDT-WPP 161/4 B

Pre-setting see reverse side

Pre-stroke setting

Charge-air press kp/cm<sup>2</sup> Settings rev/min

Difference in delivery cm<sup>3</sup> 1. Settings 5,3-5,7 1.1 Timing device travel 2000 kp/cm<sup>2</sup> 2000 5,6-6,1 12 Supply pump pressure cm<sup>3</sup>/1000 strokes 1400 36,0-37,0 1,5 1.3 Full-load delivery without cm<sup>3</sup>/1000 strokes Full-load delivery with charge-air pressure . 320 10,0-14,0 cm3/1000 strokes 3,0 1.4 Idle speed regulation 60-100 cm<sup>3</sup>/1000 strokes 50 15 Start 2310 17,0-23,0 cm<sup>3</sup>/1000 strokes

2. Test Specifications

1.6 Full-load speed regulation

Checking values in brackets

2.1 Timing device 0,6-1,6(0,3-1,9) 3,0-4,0(2,7-4,3)

2200-2400(2170-2430) end (6,9-7,6)

22 Supply pump 1,0-1,5(0,8-1,7) kp/cm<sup>2</sup>

2000 (5,4-6,3)

Overflow delivery rev/min cm3/10 s

500 70-140(60-150

2150 70-140(60-150)

23 Fuel deliveries

| Speed control lever | Delivery lever | rev/min   | cm <sup>3</sup> /1000 strokes | Charge air pressure kp/cm² |
|---------------------|----------------|-----------|-------------------------------|----------------------------|
| End stop            | Full           | 2330-2370 |                               |                            |
|                     | ŀ              |           | 10,0                          | 1                          |
|                     |                | 2310      | 17,0-23,0 (15,0-25,0)         |                            |
|                     |                | 2150      | 32,7-35,7 (31,7-36,7)         |                            |
|                     |                | 1400      | (35,5-37,5)                   |                            |
|                     |                | 800       | 28,5-31,5 (27,5-32,5)         |                            |
|                     |                | 500       | 31,1-34,1 (30,0-35,0)         |                            |
|                     | Stop           | 2250      | 0                             |                            |
| Idle stop           | Full           | 430-570   | 0                             |                            |
|                     |                | 320       | (8,0-16,0)                    |                            |
|                     | Start          | 50        | (50-120)                      |                            |
|                     |                | 300       | max.31,0                      |                            |

| Angle to the stop-plate   | Pre-setting dimensions              |
|---|-------------------------------------|
| Pump  a = 50 ± 4°  b = 52 ± 5°  a = 10 ± 2°  b = max 5°  b = max 5° | Pump DimensioFiv1 90 Dimensio 25 90 |
|   |                                     |

173-1 Test as 173, but play between lever 173-2 and stop for increased idle = 5.5 - 2.0 mm.

WPP 001/4 PER 5,8 o 1. Edition

VA6/11H 1300 CL 179-2

DHK: 1688 901 020

Perkins company 16 354 0 460 316 038

Pre-stroke setting 0,3  $_{\text{mm}} \stackrel{\text{t}}{=} 0,02(0,04)$  Setting of the pointer at a stroke of 1 mm in

All test specifications are valid for **Bosch Fuel Injection Pump Test Benches** and Testers Test Intructions and Test Equipment VDT-WPP 161/4 B Pre-setting see reverse side

relation to outlet "A"

| 1. Settings  | iev/min    | Settings              |                               | Charge-air press<br>kp/cm² | Difference in delivery cm <sup>3</sup> |
|--|------------|-----------------------|-------------------------------|----------------------------|--|
| 1.1 Timing device travel                               | 500        | 4,4-5,0               | mm                            | 0                          |  |
| 1.2 Supply pump pressure                               | 500        | 4,5-5,0               | kp/cm²                        | 0                          |  |
| 1.3 Full load delivery without                         | 500        | 80,0-81,0             | cm <sup>3</sup> /1000 strokes | 0                          |  |
| charge air pressure Full load delivery with charge air | 1300       | 96,0-97,0             | cm³/1000 strokes              | 0,7                        |  |
| pressure  1 4 Idle speed regulation                    | 250<br>100 | 19,0-25,0<br>min. 100 | cm³/1000 strokes              | 0                          | . 1                                    |
| 1 5 Start  1 6 Full load speed regulation              | 1550       | 36,0-44,0             | cm <sup>3</sup> /1000 strokes | 0.7                        |  |

| 2. Test Sp          | ecificatio     | ns Checkiggigilui                          | es in brackets 500   | 650 680-780                            |
|---------------------|----------------|--|--|--|
| 2 1 Timing device   | rev/min        | 1,0-2,0(0,7                                | -2,3) (4,1-5,3) 6,0-7  | ,0 (5,7-7,3)7,0-7,7<br>(6,7-8,0)       |
|                     |                | 200  | 500  | 1300                                   |
| 2 2 Supply pump     | rev/min        | 2.5-3.0(2.3                                | -3,2) (4,3-5,2) 6,8-   | -7,3 (6,6-7,5)                         |
|                     | kp/cm²         |  |  | 1300                                   |
| Overflow delivery   | rev/min        | 500<br>55-100 (40                          | .110) 55-  | -100 (40-110)                          |
|                     | cm 1/10 s      | 33 133 (13                                 |  |  |
| 23 Fuel deliveries  |                |  |  |  |
| Speed control lever | Delivery lever | rev/min                                    | cm³/1000 strokes   | Charge air pressure kp/cm <sup>2</sup> |
| End stop            | Full           | 1600<br>1550<br>1300<br>1100<br>500<br>500 | max. 15,0<br>(35,0-45,0)<br>(95,5-97,5)<br>93,5-95,5(92,5-96,5)<br>84,5-88,5(83,5-89,5)<br>(79,5-81,5) | 0,7<br>0,7<br>0,7<br>0,7<br>0,3        |
|                     | Stop           | 1300                                       | 0  |  |
| Idle stop           | Full           | 330.380                                    | 0  |  |
|                     |                | 250  | (18,0-26,0)  |  |
|                     | Start          | 100<br>100-200                             | min. 100   |  |

| Angle to the stop-plate                                  | Pre-setting dimensions                  |
|--|---|
| Pump  a = 25 ± 4°  b = 55 + 8°  c = 30 - 8°  c = 60 + 8° | Pump Dimension IV Dimension V= 25 g CMM |

LDA

Start of timing advance 0,13 - 0,26 bar

End of timing advance 0,31 - 0,37 bar

2. Test Specifications Checking values in brackets

WPP 001/4 IHC 5,8 V 7

1. Edition

VA 6/10 H 1100 CR 401-3 0 460 306 262

DHK: 1 688 901 020

superse<del>d</del>es compan**J**HC engine D 358/956

See VDT-WJP 161/4, Suppl. 1) Setting of the pointer at a stroke of 1 mm in

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers **Test Intructions and Test Equipment** 

**VDT-WPP 161/4 B** 

Pre-setting see reverse side

| lation to outlet "A".                              |         | Pre-setting see reverse side |                  |                            |                                       |
|--|---------|------------------------------|------------------|----------------------------|---------------------------------------|
| 1. Settings  | rev/min | Settings                     |                  | Charge-air press<br>kp/cm² | Difference in deliver cm <sup>3</sup> |
| 1 1 Timing device travel                           | 800     | 2,4-3,0                      | mm               | ;                          |                                       |
| 1 2 Supply pump pressure                           | 800     | 5,0-5,6                      | kp/cm²           | <b>;</b>                   |                                       |
| 1.3 Full load delivery without charge air pressure | 800     | 67,2-68,2                    | cm³/1000 strokes |                            | 3,0                                   |
| Full load delivery with charge air                 | -       | -                            | cm³/1000 strakes |                            |                                       |
| pressure  1 4 Idle speed regulation                | 350     | 15,0-21,0                    | cm³/1000 strokes |                            | 2,5                                   |
| 1 5 Start  | 100     | min. 80                      | cm³/1000 strokes |                            |                                       |
| 1.6 Full load speed regulation                     | 1150    | 34,0-40,0                    | cm³/1000 strokes |                            |                                       |

| 2.1 Timing device                  | rev/min<br>mm                 | 600<br>0.8-1.6(0.5-1                    | 800 1000<br>,9) (2,0-3,4) 3,7-4,3(3,  | 1100<br>3-4,7) 3,8-4,5(3,5-4,8) |
|------------------------------------|-------------------------------|---|---|---------------------------------|
| 2 2 Supply pump  Overflow delivery | rev/min<br>kp/cm <sup>-</sup> | 200                                     | 800 1100<br>,5) (4,8-5,8) 5,9-6,5(5   | ,7-6,7)                         |
|                                    | cm <sup>1</sup> /10 s         | 55-100(40-110                           |   |                                 |
| 2 3 Fuel deliveries                |                               |   |   |                                 |
| Speed control lever                | Delivery lever                | rev/min                                 | cm³/1000 strokes  | Charge-air pressure kp/cm²      |
| End stop                           | Full                          | 1190-1240<br>1150<br>1080<br>800<br>500 | 0<br>(33,0-41,0)<br>65,5-68,5 (64,5-69,5)<br>(66,7-68,7)<br>67,0-70 (66,0-71,0) |                                 |
|                                    | Stop                          | 1100                                    | 0   |                                 |
| Idle stop                          | Full                          | 520-580<br>350                          | 0 (14,0-22,0)   |                                 |
|                                    | Start                         | 100                                     | min. 80   | ·                               |
| nd stop                            |                               | 260-360                                 |   |                                 |

**H5** 

| Angle to the stop-plate  | Pre-setting dimensions                          |
|--|---|
| Pump<br>$a = 25 \pm 4^{\circ}$<br>$8 = 45 \pm 8^{\circ}$<br>$1 = 30 - 8^{\circ}$<br>$2 = 50 + 8^{\circ}$ | Pump Dimension (₹ 3,0 mm) Dimension √= 24,65 mm |

WPP 001/4 IHC 5,8 V 6

1. Edition

estoil-ISO 4113

VA 6/10 H 1150 CR 401-4

0 460 306 264

DHK: 1 688 901 020

supersedes...

company IHC

engine D 358/1056

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

Test intructions and Test Equipment VDT-WPP 161/4 B

VDT-WPP 161/4 B
Pre-setting see reverse side

Pre-stroke setting of the pointer at a stroke of 1 mm in relation to outlet "A".

Difference in delivery cm<sup>3</sup> Charge air press rev/min 1. Settings kp/cm<sup>2</sup> 2,4-3,0 800 mm 1.1 Timing device travel 800 4,8-5,4 kp/cm<sup>2</sup> 1.2 Supply pump pressure 3,0 70.5-71.5 800 cm<sup>3</sup>/1000 strakes 1.3 Full-load delivery without charge-air pressure cm3/1000 strokes Full-load delivery with charge-air 2,5 15,0-21,0 350 cm<sup>3</sup>/1000 strokes 1.4. Idle speed regulation min. 80 100 cm<sup>3</sup>/1000 strokes 1200 38,5-44,5 cm<sup>3</sup>/1000 strokes 1.6 Full-load speed regulation

| 2. Test Sp         | ecificat              |  |
|--------------------|-----------------------|--|
| 2.1 Timing device  | rev/min               | 600 800 1000 1150  |
|                    | mm                    | 0,9-1,7(0,6-2,0) (2,0-3,4) 3,7-4,3(3,3-4,7) 3,8-4,5(3,4-4,8) |
| 2 2 Supply pump    | rev/min               | 200 800 1150   |
|                    | kp/cm²                | 1,7-2,3(1,5-2,5) (4,6-5,6) 6,0-6,6(5,8-6,8)                  |
| Overflow delivery  | rev/min               | 500 1150   |
|                    | cm <sup>3</sup> /10 s | 55-100(40-110) 55-100(40-110)                                |
| 23 Fuel deliveries |                       |  |

| 2.3 Fuel deliveries |                |   |  |                            |
|---------------------|----------------|---|--|----------------------------|
| Speed control lever | Delivery lever | rev/min                                 | cm³/1000 strokes   | Charge-air pressure kp/cm² |
| End stop            | Full           | 1240-1300<br>1200<br>1130<br>800<br>500 | (37,5-45,5)<br>70,0-73,0 (69,0-74,0)<br>(70,0-72,0)<br>71,5-74,5 (70,5-76,0) |                            |
|                     | Stop           | 1150                                    | o  |                            |
| Idle stop           | Full           | 510-570<br>350                          | 0 (14,0-22,0)  |                            |
| End stop            | Start          | 100<br>260-360                          | min. 80  |                            |

| Pump - 2 8 mm                             |             |
|---|-------------|
| Dimension V 2,8 mm = 24,65 mm Dimension V | ٠           |
|   | Dimension V |

2. Edition

supersedes Volvo

company: TD 40 A (93 kW) engine:

WPP 001/4 Volvo 3,6 n

VE 6/11 F 1800 L 18-3

0 460 416 027

Pre-stroke setting

All test specifications are valid only for Bosch Fuel-injection Pump Test Benches and Testers 0,3

 $^{2}0.02(0.04)$ 

Overflow temperature 45° C

Test Instructions and Test Equipment

see VDT-W-460/.

| Rot. speed rev/min | Settings                                  |   | Charge-air press.<br>bar (kgf/cm²)  | Difference in delivery cm <sup>3</sup>   |
|--------------------|---|---|---|--|
| 1500               | 3,6-4,0                                   | mm  | 0,75  |  |
| 1500               | 6,6-7,2                                   | bar (kgf/cm²)   | 0,75  |  |
| 500                | 43,5-45,5                                 | cm <sup>9</sup> /1000 strokes   | 0   | 2,5(3,0)   |
| 1500               | 62,0-63,0                                 | cm³/1000 strokes  | 0,75  |  |
| 325                | 8,0-12,0                                  | cm <sup>3</sup> /1000 strokes   | 0   |  |
| 100                | min. 60,0                                 | cm <sup>3</sup> /1000 strokes   | 0   |  |
| 2000               | 19,0-25,0                                 | cm³/1000 strokes  | 0,75  |  |
| -                  | ·   |   |   |  |
|                    | 1500<br>1500<br>500<br>1500<br>325<br>100 | 1500 3,6-4,0 1500 6,6-7,2 500 43,5-45,5 1500 62,0-63,0 325 8,0-12,0 100 min. 60,0 | 1500 3,6-4,0 mm  1500 6,6-7,2 bar (kgf/cm²)  500 43,5-45,5 cm³/1000 strokes  1500 62,0-63,0 cm³/1000 strokes  325 8,0-12,0 cm³/1000 strokes  100 min. 60,0 cm³/1000 strokes | 1500   3,6-4,0   mm   0,75   1500   6,6-7,2   bar (kgf/cm²)   0,75   1500   43,5-45,5   cm³/1000 strokes   0   1500   62,0-63,0   cm²/1000 strokes   0,75   325   8,0-12,0   cm³/1000 strokes   0   100   min. 60,0   cm³/1000 strokes   0 |

| 2. Test Spec        | cifications           | checking values in brackets ( | )                |                                 |  |
|---------------------|-----------------------|-------------------------------|------------------|---------------------------------|--|
| 2 1 Timing device   | n = rev/min           | 1100                          | 1500             | 1800                            |  |
| LDA=0.75 bar        | mm                    | 1,6-2,4(1,3-2,7)              | (3,1-4,5)        | 4,5-5,3 (4,2-5,6)               |  |
| 2 2 Supply pump     | n = rev/min           | 400                           | •                | 1800                            |  |
| LDA=0,75 bar        | bar (kgf/cm²)         | 2,8-3,4                       | 7,7-8,3          |                                 |  |
| Overflow delivery   | n = rev/min           | 500                           |                  | 1800                            |  |
|                     | cm <sup>3</sup> /10 s | 55-138 (40-153)               |                  | 55-138 (40-153)                 |  |
| 2 3 Fuel deliveries |                       |                               | ·                | 3. Dimensions                   |  |
| Speed control lever | Rot speed             | Fuel delivery                 | Charge-air press | and adjustment Designation   mm |  |

|   | cm <sup>3</sup> /10 s                               | 55-138  | (40-153)        |                                   | 55-138               | (40-153)                                       |
|---|---|---|-----------------|-----------------------------------|----------------------|--|
| 2 3 Fuel deliveries Speed control lever | Rot speed   | Fuel delivery                                   |                 | Charge-air press<br>bar (kgf/cm²) | 3. Dimer             | ISIONS<br>for assembly<br>and adjustment<br>mm |
| End stop                                | 2100<br>2000<br>1900<br>1800<br>1500<br>*500<br>500 | max. 2,0<br>39,0-49,0<br>56,3-59,3<br>50,0-52,0 | (60,25-64,75)   | 0,75                              | K<br>KF<br>MS<br>SVS | 5,9-6,2<br>1,2-1,4<br>max. 4,7                 |
|   |   |   |                 |                                   | XL                   | 10,4-16,4                                      |
| Idle stop                               | 400<br>325<br>110<br>220                            | max. 3,0<br>min. 60<br>max. 40                  | (6,0-14,0)      |                                   |                      | old-pressure<br>sator stroke                   |
| 2 4 Solenoid                            | max. cut-in vol                                     | mage xx min.                                    | 10 V<br>ge 12V. |                                   |                      |  |

46

WPP001/4 VMA 2,0 d
1. Edition

En

VE 4/9 F 2150 L31-1

Overflow temperature 45° C

supersedes "

company: Motori VM engine: HR 488 HT

0 460 494 133

All test specifications are valid only for Bosch Fuel-injection Pump Test Benches and Testers

mm

Test Instructions and Test Equipment

see VDT-W-460/.

Pre-stroke setting

| 1. Settings  | Rot speed rev/min |                    |                               | Charge-air press.<br>bar (kgf/cm²) | Difference in delivery cm <sup>3</sup> |
|--|-------------------|--------------------|-------------------------------|------------------------------------|--|
| 1 1 Timing device travel   | 1900<br>1900      | 6,4-6,8<br>5,7-6,3 | mm<br>bar (kgf/cm²)           | 0,8<br>0,8                         |  |
| 1.2 Supply-pump pressure   | 1600              | 46,5-47,5          | cm <sup>3</sup> /1000 strokes | 0,8                                | 3,0                                    |
| 1.3 Full load delivery with charge air pressure Full-load delivery without | 1600              | 34,5-35,5          | cm³/1000 strokes              | 0                                  |  |
| charge air pressure 1 4 Idle regulation                                    | 400               | 8,0-12,0           | cm³/1000 strokes              | 0                                  | 3,0                                    |
| 1.5 Full speed regulation  | 2300              | 27,5-33,5          | cm³/1000 strokes              | 0,8                                |  |
| 1 6 Start  | 100               | min. 44,0          | cm <sup>3</sup> /1000 strokes | 0                                  |  |
| 1.7 Load dependent port closing  | -                 |                    |                               |                                    |  |

| 2. Test Spe       | cifications                          | checking values in brackets ( ) |                        |                        |
|-------------------|--------------------------------------|---------------------------------|------------------------|------------------------|
| 2 1 Timing device | n = rev/min                          | 1,3-2,1(1,0-2,4)                | 1900<br>(5,9-7,3) 7,5- | 2150<br>-8,3 (7,2-8,6) |
| 2 2 Supply pump   | n = rev/min<br>bar (kgf/cm²)         | 400<br>2,0-2,6                  | 6,3-6                  | 150<br>5,9             |
| Overflow delivery | n = rev/min<br>cm <sup>1</sup> /10 s |                                 |                        |                        |
|                   | . 1                                  |                                 | 2 Die                  | nencions               |

|  | cm 1/10 s  |  |   |                      |  |
|--|--|--|---|----------------------|--|
| 2 3 Fuel deliveries  Speed control lever | Rot speed  | Fuel delivery  | Charge-air press                        | 3. Dimer             | 18ions<br>for essembly<br>and adjustment<br>mm |
| End stop                                 | 2600<br>2450<br>2300<br>2150<br>1600<br>* 600<br>600 | max.2,0<br>max. 10,0<br>(26,5-34,5)<br>40,0-43,0 (39,2-43,8)<br>(44,7-49,3)<br>(32,7-37,3)<br>38,3-41,3 (36,8-42,8)<br>30,5-33,5 (29,0-35,0) | 0,8<br>0,8<br>0,8<br>0,8<br>0,8<br>0,27 | K<br>KF<br>MS<br>SVS | 3,3<br>5,7-5,9<br>0,7-0,9<br>5,6               |
| Idle stop                                | 800<br>500<br>400<br>350<br>450                      | max. 2,0<br>max. 6,0<br>(6,0-14,0)<br>min. 44<br>max. 43   |   |                      | old-pressure<br>sator stroke<br>mm             |
| 2.4 Solenoid                             | max cut-in vol                                       | age xxx min. 10 V<br>xx rated voltage 12V.   |   |                      |  |

**BOSCH** 

Geschaftsbereich KH. Kundendienst. Kfz-Ausrustung.
1980 by Robert Bosch GmbH, Postfach 50, D-7000 Stuffgart 1. Printed in the Federal Republic of Germany Imprimé en République Fédérale d'Allemagne par Robert Bosch GmbH.

8.84

(7)

1.4

S103480 41

## Test Specifications Distributor-type Fuel-injection Pumps

46

WPP 001/FIA 1,7a

5. Edition

VE 4/0 E 23

Pre-stroke setting

Overflow temperature 45° C

supersedes 9.83

VE 4/9 F 2300 R 54 0 460 494 044

company: Fiat x8/28

All test specifications are valid only for Bosch Fuel-injection Pump Test Benches and Testers

**Test Instructions and Test Equipment** 

mm see VDT-W-460/...

| 1. Settings  | Rot. speed rev/min |             |                                   | Charge-air press.<br>bar (kgf/cm²) | Difference in delivery cm <sup>3</sup> |
|--|--------------------|-------------|-----------------------------------|------------------------------------|--|
| 1 1 Timing device travel   | 1500               | 4,3-4,7     | mm                                |                                    |  |
| 1 2 Supply-pump pressure   | 1500               | 5,1-5,7     | bar (kgf/cm²)<br>cm³/1000 strokes |                                    |  |
| 1 3 Full-load delivery with<br>charge air pressure<br>Full-load delivery without | 1500               | 34,2 - 35,2 | cm <sup>3</sup> /1000 strokes     |                                    | 2,5 (3,0)                              |
| charge air pressure  1 4 Idle regulation   | 350                | 8,0-12,0    | cm³/1000 strokes                  |                                    | 2,5 (3,0)                              |
| 1 5 Full-speed regulation  | 2400               | 16,0-22,0   | cm <sup>3</sup> /1000 strokes     |                                    |  |
| 1 6 Start  | 100                | min. 48     | cm <sup>3</sup> /1000 strokes     |                                    |  |
| 1.7 Load-dependent port-closing  | 1500               | -           |                                   |                                    |  |

| 2. Test Spe       | ecifications                         | checking values in brackets ( | )                                       |                           |
|-------------------|--------------------------------------|-------------------------------|---|---------------------------|
| 2 1 Timing device | n = rev/min<br>mm                    | 800<br>1,7-2,5 (1,4-2,8)      | 1500<br>(3,8-5,2)                       | 2300<br>7,2-8,0 (6,9-8,3) |
| 2 2 Supply pump   | n = rev/min<br>bar (kgf/cm²)         | 400<br>2,5-3,1                |   | 2300<br>6,9-7,5           |
| Overflow delivery | n = rev/min<br>cm <sup>3</sup> /10 s | 400<br>55-138(40-153)         | *************************************** | 2300<br>55-138(40-153)    |
|                   | _1                                   |                               |   | 2 Dimensions              |

| Overflow delivery   | n = rev/min<br>cm <sup>3</sup> /10 s | 55-138(40-153)                                 |                                   | 55-138(40-153)                            |           |  |
|---------------------|--------------------------------------|--|-----------------------------------|---|-----------|--|
| 2 3 Fuel deliveries |                                      |  |                                   | 3. Dimensions Ior assembly and adjustment |           |  |
| Speed control lever | Rot. speed rev/min                   | Fuel delivery<br>cm <sup>3</sup> /1000 strokes | Charge air press<br>bar (kg1/cm²) | Designation                               | mm        |  |
| End stop            | 2500                                 | 4,5-10,5 (3,5-11,5)                            |                                   | K   | 3,2-3,4   |  |
|                     | 2400                                 | (15,0-23,0)                                    |                                   | KF  | 5,7-5,9   |  |
|                     | 2250                                 | 28,0-30,0(26,7-31,3)                           |                                   | MS  | 1,7-1,9   |  |
|                     | 1500                                 | (32,4-37,0)                                    |                                   | svs                                       | max. 3,5  |  |
|                     | 600                                  | 23,5-26,5(22,0-28,0)                           |                                   |   |           |  |
| switch-off          |                                      |  |                                   | XAK                                       | 20,1-22,1 |  |
| Switch-on           | 2300                                 | 0  |                                   | XBL                                       | 9,5-13,3  |  |
| Idle stop           | 350                                  | (6,0-14,0)                                     |                                   | Observations                              |           |  |
|                     | 400                                  | max. 4,0                                       |                                   |   |           |  |
|                     | 540                                  | 0  |                                   |   |           |  |
| 2 4 Solenoid        | max. cut-in vol                      |  |                                   |   |           |  |

H11

6

## **Test Specifications** Distributor-type Fuel-injection Pumps

WPP001/4 MAN 5,6 p 1. Edition

VE6/11F 1100 R55-8 0 460 416 037

Overflow temperature 45° C

supersedes company:

MAN

engine:

DO 226 ME

All test specifications are valid only for Bosch Fuel-injection Pump Test Benches and Testers

Test Instructions and Test Equipment

Pre-stroke setting

 $\frac{1}{2}$ 0,02 (0,04)

see VDT-W-460/...

| 1. Settings                                    | Rot. speed<br>rev/min | Settings   |                               | Charge-air press.<br>bar (kgf/cm²) | Difference in delivery cm <sup>3</sup> |
|--|-----------------------|------------|-------------------------------|------------------------------------|--|
| 1 1 Timing device travel                       | 700                   | 2,9-3,3    | mm                            |                                    |  |
| 1 2 Supply-pump pressure                       | 700                   | 3,9-4,5    | bar (kgf/cm²)                 |                                    |  |
| 1 3 Full-load delivery with                    | -                     |            | cm <sup>3</sup> /1000 strokes |                                    |  |
| charge-air pressure Full-load delivery without | 700                   | 69,0-70,0  | cm³/1000 strokes              |                                    | 3,5 (4,0)                              |
| charge-air pressure 1 4 Idle regulation        | 300                   | 2,5-6,5    | cm <sup>3</sup> /1000 strokes |                                    | 3,0 (4,0)                              |
| 1 5 Full-speed regulation                      | 1250                  | 19,0-25,0  | cm <sup>3</sup> /1000 strokes |                                    |  |
| 1 6 Start                                      | 100                   | 75,0-105,0 | cm <sup>3</sup> /1000 strokes |                                    |  |
| 1.7 Load-dependent port-closing                | -                     |            |                               |                                    |  |

| 2 1 Timing device   | n = rev/min   | 500<br>0,9-1,7 (0,6-2,0)   | 700<br>(2,4-3,8)                 | 900<br>4,0-4,8 (3,7-5,1)                     |                           |  |
|---|---|--|----------------------------------|--|---------------------------|--|
| 2 2 Supply pump   | n = rev/min<br>bar (kgf/cm²)                                      | 500<br>2,9-3,5   |                                  | 1100<br>5,7-6,3                              |                           |  |
| Ovarflow delivery   | n = rev/min<br>cm <sup>3</sup> /10 s                              | 500<br>55-138 (40-153)   | 1100<br>55-138 (40 <b>-</b> 153) |  |                           |  |
| 2 3 Fuel deliveries  Speed control lever Rot. speed Fuel delivery Charge-air press. par (kgf/cm²) |   |  | 3. Dimens                        | dons<br>for assembly<br>and adjustment<br>mm |                           |  |
| End stop  | 1330<br>1250<br>1100<br>900<br>700<br>500                         | max. 1,5<br>(17,5-26,5)<br>75,5-78,5(74,4-79,6)<br>73,5-76,5(72,4-77,6)<br>(66,9-72,1)<br>64,0-68,0(62,6-69,4) |                                  | K<br>KF<br>MS<br>SVS                         | 5,7-5,9<br>1,2-1,4<br>2,5 |  |
| switch-off  |   |  |                                  | A<br>B                                       |                           |  |
| idie stop   | 340<br>300  | max. 1,5 (0-9,0)   |                                  | Observations                                 |                           |  |
| End stop  | 350<br>450  | min. 80<br>max. 80   |                                  |  |                           |  |
| 2.4 Solenoid  | max.cut-in voltage xx min. 10 V  way younge, wirated voltage 12V. |  |                                  |  |                           |  |

Geschaftsbereich KH. Kundendienst. Kfz Ausrustung < 1980 by Robert Bosch GmbH, Postfach 50, D-7000 Stuttgart 1. Printed in the Federal Republic of Germany Imprimé en République Fédérale d'Allemagne par Robert Bosch GmbH.

WPP 001/4 IHC 5,8 t

3. Edition

VE 6/12 F 1350 R 64 0 460 426 016

Pre-stroke setting

superseda .83 Nozzle-and-holder assembly company IHC

1 688 901 020 (172 + 3 bar) engine: D 358/PC 11

#### Overflow temperature 45° C

All test specifications are valid only for Bosch Fuel injection Pump Test Benches and Testers

Test Instructions and Test Equipment

Setting of the pointer at a stroke of 1 mm in see VDT W-460/ mm relation to outlet "A".

| 1. Settings                                    | Rot speed rev/min | Settings  | ·                | Charge-air press<br>bar (kgf/cm²) | Difference in delivery cm <sup>3</sup> |
|--|-------------------|-----------|------------------|-----------------------------------|--|
| 1 1 Timing device travel                       | 1150              | 5,2-5,6   | mm               |                                   |  |
| 2 Supply pump pressure                         | 1150              | 5,6-6,2   | bar (kgf/cm²)    |                                   |  |
| 1 3 Full-load delivery without                 | -                 | -         | cm³/1000 strokes |                                   |  |
| charge air pressure Full-load delivery with    | 1150              | 84,0-85,0 | cm³/1000 strokes |                                   | 3,5 (4,5)                              |
| charge air pressure  1 4 Idle speed regulation | 500               | 14,5-20,5 | cm³/1000 strokes |                                   | 3,5 (4,5)                              |
| 1 5 Start                                      | 1400              | 44,0-50,0 | cm³/1000 strakes |                                   |  |
| t 6 Full-load speed regulation                 | 100               | min.100,0 | cm³/1000 strokes |                                   |  |
| 1,7 Load-dependent start of delivery           | -                 | 4%        |                  |                                   |  |

| 2. Test Spe       | cifications                          | checking values in brackeds ( | •                 |                          |
|-------------------|--------------------------------------|-------------------------------|-------------------|--------------------------|
| 2 1 Timing device | n = rev/min                          | 600<br>1,6-2,4(1,3-2,7)       | 1150<br>(4,7-6,1) | 1300<br>5,3-6,1(5,0-6,4) |
| 2 2 Supply pump   | n = rev/min<br>bar (kgf/cm²)         | 400 2,7-3,3                   |                   | 1300<br>6,0-6,6          |
| Overflow delivery | n = rev/min<br>cm <sup>3</sup> /10 s | 500<br>55-138(40-163)         |                   | 1350<br>55-138(40-158)   |

| Speed control lever | Rot speed rev/min            | Fuel delivery<br>cm <sup>3</sup> /1000 strokes                          | Charge-air press<br>bar (kgf/cm²) |
|---------------------|------------------------------|---|-----------------------------------|
| End stop            | 1510<br>1450<br>1400<br>1300 | max. 1,0<br>9,0-17,0 (8,0-18,0)<br>(42,0-52,0)<br>80,0-83,0 (78,5-84,5) |                                   |
|                     | 1150                         | (81,5-87,5)   |                                   |
|                     | 800                          | 77,0-81,0 (76,0-82,0)   |                                   |
|                     | 500                          | 63,0-68,0 (61,8-69,2)   |                                   |
| switch-off          | 1350                         | 0   |                                   |
| ide stop            | 570<br>520<br>500            | max. 1,0<br>min. 4,0<br>(12,5-22,5)                                     |                                   |
| End stop            | 250<br>350                   | min. 100<br>max. 80   |                                   |
| 2 4 Solenoid        | max cut-in volta             | " wated veltage 17V   |                                   |

| 3. Dimen     | BIONS for assembly and adjustment |
|--------------|-----------------------------------|
| Designation  | and solosiment                    |
| K            | 3,2-3,4                           |
| KF           | 5,7-5,9                           |
| MS           | 1,0~1,2                           |
| svs          | max.6,0                           |
| , XK         | 20,2-22,2                         |
| B XL         | 15,8-19,8                         |
| Observations |                                   |
|              |                                   |
|              |                                   |
|              |                                   |
|              |                                   |

Testoil-ISO 4113

## **Test Specifications** Distributor-type Fuel-injection Pumps

WPP 001/4 VWW 1.6 h 4. Edition

VE 4/9 F 2250 R 78 0 460 494 062/063

Overflow temperature 45° C

supersedes 11.82 VWW company:

engine:

086T-1,6

All test specifications are valid only for Bosch Fuel-injection Pump Test Benches and Testers

Test Instructions and Test Equipment

see VDT-W-460/...

Pre-stroke setting

| 1. Settings                                    | Rot. speed rev/min | Settings  |                               | Charge-air press.<br>bar (kgf/cm²) | Difference in delivery cm <sup>3</sup> |
|--|--------------------|-----------|-------------------------------|------------------------------------|--|
| 1 1 Timing device travel                       | 1500               | 3,8-4,2   | mm                            | 0,75                               |  |
| 1 2 Supply-pump pressure                       | 1500               | 5,6-6,1   | bar (kgf/cm²)                 | 0,75                               |  |
| 1 3 Full-load delivery with                    | 600                | 23,5-24,5 | cm <sup>3</sup> /1000 strokes | 0                                  |  |
| charge air pressure Full-load delivery without | 1500               | 43,5-44,5 | cm <sup>3</sup> /1000 strokes | 0,75                               | 2,5 (3,0)                              |
| charge air pressure                            | 475                | 7,0-11,0  | cm³/1000 strokes              | 0                                  | 2,5 (3,0)                              |
| 1 5 Full-speed regulation                      | 100                | min. 38,0 | cm <sup>3</sup> /1000 strakes | 0                                  |  |
| 1 6 Start                                      | 2525               | 9,0-15,0  | cm <sup>3</sup> /1000 strokes | 0,75                               |  |
| 1.7 Load-dependent port-closing                |                    |           |                               |                                    |  |

| 2. Test Spec      | ifications                           | checking values in brackets ( | )                 |                                   |
|-------------------|--------------------------------------|-------------------------------|-------------------|-----------------------------------|
|                   | n = rev/min<br>mm                    | 1000<br>1,8-2,6 (1,5-2,9)     | 1500<br>(3,3-4,7) | 2250<br>6,1-6,9 (5,8-7,2)         |
| 22 Supply pump    | n = rev/min<br>bar (kgf/cm²)         | 600<br>3,3-3,9                |                   | 2250<br>7 <b>,4-</b> 8 <b>,</b> 0 |
| Overflow delivery | n = rev/min<br>cm <sup>3</sup> /10 s | 55-125 (40-140)               |                   | 2250<br>55-125 (40-140)           |

| Rot speed rev/min                                  | Fuel delivery cm <sup>3</sup> /1000 strokes   |  | Charge-air press<br>bar (kgf/cm²)  |
|--|---|--|--|
| 2730-1870<br>2525<br>2250<br>1500<br>* 1000<br>600 | 0<br>38,5-40,5<br>33,5-34,5   | (8,0-16,0)<br>(37,2-41,8)<br>(41,7-46,3)<br>(31,0-37,0)<br>(21,0-27,0)                             | 0,75<br>0,75<br>0,3  |
| 2250<br>400  | 0   |  |  |
| 1200<br>475  | max. 5,0  | (5,0-13,0)   |  |
| 400<br>500   | min. 22.0<br>max. 30.0  |  |  |
|  | 2730-1870<br>2525<br>2250<br>1500<br>* 1000<br>600<br>2250<br>400<br>1200<br>475<br>400 | 2730-1870 0 2525 2250 38,5-40,5 1500 1000 33,5-34,5  2250 0 400 0  1200 max. 5,0 475 400 min. 22,0 | 2730-1870 0 2525 2250 38,5-40,5 (37,2-41,8) 1500 (41,7-46,3) * 1000 600 33,5-34,5 (31,0-37,0) 600 0  1200 max. 5,0 400 min. 22,0 |

| 3. Dimensions for assembly and adjustment Designation   mm |           |  |  |  |
|--|-----------|--|--|--|
| K  | 3,2-3,4   |  |  |  |
| KF   | 5,7-5,9   |  |  |  |
| MS   | 1,2-1,4   |  |  |  |
| svs  | 4,4       |  |  |  |
|  |           |  |  |  |
| A XK   | 18,4-20,4 |  |  |  |
| 8 XL   | 10,0-13,6 |  |  |  |

#### **Observations**

Manifold-pressure compensator stroke = 4,0 mm Correction at the adjusting nut. (46)

Testoil-ISO 4113

### **Test Specifications** Distributor-type Fuel-injection Pumps

WPP 001/4 Ope 1,6 d 5. Edition

VE 4/9 F 2300 R 82;

1.7 Load-dependent port-closing

VE ...R 82-1

0 460 494 071

Pre-stroke setting

0 460 494 114

Overflow temperature 45° C

2.84 supersedes

company: engine:

Opel 2033-1,6 l

All test specifications are valid only for Bosch Fuel-injection Pump Test Benches and Testers mm

Test Instructions and Test Equipment

see VDT-W-460/...

| I. Settings  | Rot. speed rev/min | Settings   |                               | Charge-air press<br>bar (kgf/cm²) | Difference in delivery cm <sup>3</sup> |
|--|--------------------|------------|-------------------------------|-----------------------------------|--|
|  | 1500               | 3,1 - 3,5  | mm                            |                                   |  |
| 1 1 Timing device travel   | 1500               | 5,0 - 5,6  | bar (kgf/cm²)                 |                                   |  |
| 1 2 Supply-pump pressure   | _                  |            | cm <sup>3</sup> /1000 strokes | Į                                 | 2,5                                    |
| 1.3 Full-load delivery with<br>charge-air pressure<br>Full-load delivery without | 1500               | 28,5-29,5  | cm³/1000 strokes              |                                   |  |
| charge-air pressure  | 450                | 6,0 - 10,0 | cm³/100© strokes              |                                   | 2,5                                    |
| 1.5 Full-speed regulation  | 2785               | 7,0 - 13,0 | cm <sup>2</sup> /1000 strokes |                                   |  |
| 1 6 Start  | 100                | min. 40,0  | cm <sup>3</sup> /1000 strokes |                                   |  |
|  | 1                  | · ·        |                               | 1                                 | 1                                      |

|   |   | 4500                               |  | 2300   |
|---|---|------------------------------------|--|--|
| n = rev/min<br>mm                           | 1,4-2,2 (1,1 - 2,5)   | ) (2,6 - 4,0)                      | 6,8-7,6 (  |  |
| n = rev/min<br>bar (kgf/cm²)                | 600<br>2,4 - 3,0  |                                    | 7  | 2300<br>,3 - 7,9                               |
| n = rev/min<br>cm <sup>3</sup> /10 s        | 500<br>55-138 (40 - 153)  |                                    | 55-13  | 2300<br>8 (40 - 153)                           |
|   | <u></u>   | T                                  | 3. Dimens  | for assembly                                   |
| Rot. speed rev/min                          | Fuel delivery cm³/1000 strokes  | Charge-air press.<br>ber (kgf/cm²) | Designation  | and adjustment<br>mm                           |
| 3000<br>2785<br>2625<br>2300<br>1500<br>600 | 27,4-29,4 (16,0-24<br>(26,1-30<br>(26,7-31  | ,0)<br>,7)<br>,3)                  | K<br>KF<br>MS<br>SVS<br>*FH  | 3,2 - 3,4 5,7 - 5,9 1,2 - 1,4 max. 2,0 1,8-2,4 |
| 2300  | 0   |                                    | a Xr   | 22,3 - 24,5<br>11,0 - 14,9                     |
| 1200<br>650<br>450<br>400<br>500            | 0<br>2,0 - 7,0 (0,5-8,<br>(4,0 -1)<br>min. 30<br>max. 28  | 5)<br>2,0)                         | stro   | rating<br>oke (KSB)<br>I-I-460/138             |
|   | n = rev/min<br>mm<br>n = rev/min<br>bar (kgf/cm²)<br>n = rev/min<br>cm³/10 s<br>Rot. speed<br>rev/min<br>3000<br>2785<br>2625<br>2300<br>1500<br>600<br>2300<br>1200<br>650<br>450<br>400 | n = rev/min bar (kgf/cm²)          | 1200   1500   1500   1,4-2,2 (1,1 - 2,5)   (2,6 - 4,0)   1,4-2,2 (1,1 - 2,5)   (2,6 - 4,0)   1,4-2,2 (1,1 - 2,5)   (2,6 - 4,0)   1,4-2,2 (1,1 - 2,5)   (2,6 - 4,0)   1,4-2,2 (1,1 - 2,5)   (2,6 - 4,0)   1,4-2,2 (1,1 - 2,5)   (2,6 - 4,0)   1,500 | 1200   |

estor SO

S

Test Specifications
Distributor-type
Fuel-injection Pumps

WPP 001/4 STE 4,0 h

1. Edition

VE 4/11 F 1100R 94-1 O 460 414 011 Overflow temperature 45° C

supersedes company engine Steyr WD 411.89

All test specifications are valid only for Bosch Fuel-injection Pump Test Benches and Testers

**Test Instructions and Test Equipment** 

Pre-stroke setting mm

sec VDT-W-460/...

| 1. Settings  | Rot speed<br>tev/min | Settings    |  | Charge-air press.<br>bar (kgf/cm²) | Difference in delivery cm <sup>3</sup> |      |
|--|----------------------|-------------|--|------------------------------------|--|------|
| 1 1 Timing device travel   | 1000                 | 5,2 - 5,6   | mm   |                                    |  |      |
| 1.2 Supply-pump pressure   | 1000                 | 5,2 - 5,8   | bar (kgf/cm²)  |                                    |  |      |
| 1 3 Full-load delivery with<br>charge-air pressure<br>Full-load delivery without | 1000                 | 73,5 - 74,5 | cm <sup>3</sup> /1000 strokes<br>cm <sup>3</sup> /1000 strokes |                                    | 3,0                                    | (4,0 |
| charge-air pressure  1 4 Idle regulation   | 300                  | 11,5- 15,5  | cm <sup>3</sup> /1000 strokes                                  |                                    | 3,0                                    | (4,0 |
| 1.5 Full-speed regulation  | 1150                 | 50,0 - 56,0 | cm³/1000 strokes   |                                    |  |      |
| 1 6 Start  | 100                  | min. 70     | cm <sup>3</sup> /1000 strokes                                  |                                    |  |      |
| 1.7 Load-dependent port-closing  |                      |             |  |                                    | <u> </u>                               |      |

| 2 2 Supply pump 500 1100 bar (kgf/cm²) 2,8 - 3,4 5,7 - 6,3 | 2. Test Spe       | ecifications                         | checking values in brackets ( | ) |                           |
|--|-------------------|--------------------------------------|-------------------------------|---|---------------------------|
| bar (kg1/cm²) 2,8 - 3,4 5,7 - 6,3                          | 2 1 Timing device |                                      |                               |   |                           |
| Quadraw delivery   n = rev/min   1100                      | 2 2 Supply pump   |                                      | 1                             |   | 1177                      |
|  | Overflow delivery | n = rev/min<br>cm <sup>3</sup> /10 s |                               |   | 1100<br>55 - 138 (40-153) |

| 2 3 Fuel deliveries |   |   |  |                                   |
|---------------------|---|---|--|-----------------------------------|
| Speed control lever | Rot. speed rev/min                          | Fuel delivery cm <sup>3</sup> /1000 strokes | ness manifestating emission on statement 1 of 10 to 2000           | Charge-air press<br>bar (kgf/cm²) |
| End stop            | 1270<br>1200<br>1150<br>1080<br>1000<br>500 | max. 2,0<br>72,5-74,5<br>66,0-70,0          | (20,5-29,5<br>(48,5-57,5<br>(70,8-76,2<br>(71,3-76,7<br>(64,6-71,4 |                                   |
| switch-off          |   |   |  |                                   |
| idle stop           | 300<br>340<br>400<br>170                    | min. 1,5<br>max. 1,0<br>min. 70             | (9,0-18,0)   |                                   |
| End stop            | 250   | max. 65                                     |  |                                   |
| 2.4 Solenoid        | max. cut-in volta                           | 80  |  |                                   |

| for assembly and adjustment |                            |
|-----------------------------|----------------------------|
| mm                          |                            |
| 3.2-3.                      | 4                          |
| 1                           |                            |
| 0,9-1                       |                            |
| 4,0                         |                            |
|                             |                            |
|                             |                            |
|                             |                            |
| <u></u>                     | -                          |
|                             |                            |
|                             |                            |
|                             | 3,2-3,<br>5,2-5,<br>0,9-1, |

BOSCH

test voltage

Testoil-ISO 4113

**Test Specifications** Distributor-type Fuel-injection Pumps

VE 4/11 F 1200 R 94-2 (FD 442)

WPP 001/4 STE 4,0 K 1. Edition

supersedes

Steyr company:

engine:

WD 411.45 47 kW

Note VDT-I-460/139 All test specifications are valid only for Bosch Fuel-Injection Pump Test Benches and Testers

Test Instructions and Test Equipment

Pre-stroke setting

0 460 414 014

see VDT-W-460/...

| 1. Settings                                    | Rot. speed rev/min | Settings    |                               | Charge-air press.<br>bar (kgf/cm²) | Difference delivery |       |
|--|--------------------|-------------|-------------------------------|------------------------------------|---------------------|-------|
| 1 1 Timing device travel                       | 800                | 3,4 - 3,8   | mm                            |                                    |                     |       |
| 1 2 Supply-pump pressure                       | 800                | 4,7 - 5,3   | bar (kgf/cm²)                 |                                    |                     |       |
| 1 3 Full-load delivery with                    | -                  | -           | cm <sup>3</sup> /1000 strokes |                                    | }                   |       |
| charge-air pressure Full-load delivery without | 800                | 64,5 - 65,5 | cm³/1000 strokes              |                                    | 3,0                 | (3,5) |
| charge-air pressure  1.4 Idle regulation       | 300                | 21,0 - 25,0 | cm <sup>3</sup> /1000 strokes |                                    | 3,0                 | (4,0) |
| 1.5 Full-speed regulation                      | 1300               | 19,0 - 25,0 | cm <sup>3</sup> /1000 strokes |                                    |                     |       |
| 1 6 Start                                      | 100                | min. 78,0   | cm <sup>3</sup> /1000 strokes |                                    |                     |       |
| 1 7 Load-dependent port-closing                | _                  | ·           |                               |                                    |                     |       |

Overflow temperature 45° C

| 2 1 Timing device          | n = rev/min           | 500  | 800                                |  | 200                                     |
|----------------------------|-----------------------|--|------------------------------------|--|---|
|                            | mm                    | 0,7-1,5 (0,4-1,8)                              | (2,9-4,3)                          | 6,6-7,4                                | (6,3-7,7)                               |
| 2.2 Supply pump            | n = rev/min           | 500  |                                    | 1200                                   |   |
|                            | bar (kgf/cm²)         | 3,2-3,8  |                                    | 6,5-7,1                                | <del></del>                             |
| Overflow delivery          | n = rev/min           | 500  |                                    | 1200                                   | .0)                                     |
|                            | cm <sup>3</sup> /10 s | 55-138 (40-153)                                | 55                                 | 5-138 (40-15                           |   |
| 2 3 Fuel deliveries        |                       |  |                                    | 3. Dimen                               | SIONS<br>for assembly<br>and adjustment |
| Speed control lever        | Rot. speed rev/min    | Fuel delivery cm <sup>5</sup> /1000 strokes    | Charge-air press.<br>bar (kgf/cm²) | Designation                            | mm                                      |
| End stop                   | 1340                  | max. 3,0                                       |                                    | к                                      | 3,3                                     |
|                            | 1300                  | (17.5-26.5)                                    |                                    | KF                                     | 5,3                                     |
|                            | 1250                  | 54,5-61,5 (53,5-62,5)<br>66,5-68,5 (64,9-70,1) |                                    | ************************************** |   |
|                            | 1180                  | 66,5-68,5 (64,9-70,1)                          |                                    | MS                                     | 1,0                                     |
|                            | 800<br>500            | (62,4-67,6)<br>59,5-62,5 (57,6-64,4)           |                                    | svs                                    | 4,0                                     |
|                            |                       |  |                                    |  |   |
| and analysis of the second |                       |  | -                                  | A .                                    |   |
| switch-off                 |                       |  |                                    | В                                      |   |
| Idle stop                  |                       | 4.5  |                                    | Observations                           |   |
|                            | 400                   | max. 1,5                                       | 1                                  |  |   |
|                            | 350                   | 5,0-11,0 (3,5-12,5)<br>(18,5-27,5)             |                                    |  |   |
|                            | 300<br>170            | min. 78  | 1                                  |  |   |
| End stop                   | 250                   | min. 60  |                                    |  |   |
| 2.4 Solenoid               | max. cut-in volts     | ge   | <u> </u>                           |  |   |
|                            | test voltage          |  |                                    | L                                      |   |

**BOSCH** 

Grischaftsbereich KH. Kundendienst. Klz: Ausrustung. 4. 1980 by Robert Bosch GmbH, Postfach 50. D-7000 Stuttgart 2. Printed in the Federal Republic of Germany Imprimé en République Fédérale d'Allemagne par Robert Bosch GmbH.

WPP 001/4 REN 2,0 e 6. Edition

VE 4/9 F 2400 R 95

Overflow temperature 45° C

Renault company:

engine: F 8 M

0 460 494 105

DHK: 1 688 901 022/130 bar

Test pressure line 6x2x450 mm / 1 680 750 073

Test Instructions and Test Equipment

Pre-stroke setting

All test specifications are valid only for Bosch Fuel-injection Pump Test Benches and Testers

see VDT-W-460/...

| 1. Settings                                    | Rot. speed rev/min | Settings  |                               | Charge-air press.<br>bar (kgf/cm²) | Difference in delivery cm <sup>3</sup> |
|--|--------------------|-----------|-------------------------------|------------------------------------|--|
| 1 1 Timing device travel                       | 1400               | 4,1-4,6   | mm                            |                                    |  |
| 1 2 Supply pump pressure                       | 1400               | 4,9-5,5   | bar (kgf/cm²)                 |                                    |  |
| 1.3 Full-load delivery with                    | -                  |           | cm <sup>3</sup> /1000 strokes |                                    | 2,5 (3,0)                              |
| charge-air pressure Full-load delivery without | 1000               | 27,8-28,8 | cm <sup>3</sup> /1000 strokes |                                    |  |
| charge-air pressure                            | 425                | 6,0-10,0  | cm <sup>3</sup> /1000 strokes |                                    | 2,0 (3,0)                              |
| 1 4 Idle regulation 1 5 Full-speed regulation  | 2650               | 10,5-16,5 | cm³/1000 strokes              |                                    |  |
| 1 6 Start                                      | 100                | min. 42,0 | cm <sup>3</sup> /1000 strokes |                                    |  |
| 1.7 Load-dependent port-closing                | 1400               |           |                               |                                    |  |

| 2. Test Spe       | cifications                  | checking values in brackets ( ) |                         |
|-------------------|------------------------------|---------------------------------|-------------------------|
| 2 1 Timing device | n = rev/min<br>mm            | siehe Blatt 2                   |                         |
| 2 2 Supply pump   | n = rev/min<br>bar (kgf/cm²) | 600<br>2,5-3,1                  | 2400<br>7,7-8,3         |
| Overflow delivery | n = rev/min<br>cm710 s       | 600<br>55-138 (40-153)          | 2400<br>55-138 (40-153) |
|                   |                              |                                 | 3. Dimensions           |

| Overflow delivery   | n = rev/min<br>cm <sup>1</sup> /10 s | 55-138 (40-153)                                |                                   |  |  |  |  |  |
|---------------------|--------------------------------------|--|-----------------------------------|--|--|--|--|--|
| 2 3 Fuel deliveries |                                      |  |                                   |  |  |  |  |  |
| Speed control lever | Rot speed rev/min                    | Fuel delivery<br>cm <sup>3</sup> /1000 strokes | Charge-air press<br>bar (kg1/cm²) |  |  |  |  |  |
| End stop            | 2800                                 | max. 6,0                                       |                                   |  |  |  |  |  |
|                     | 2650                                 | (9,5-17,5)                                     | i                                 |  |  |  |  |  |
|                     | 2500                                 | 21,0-29,0 (21,0-29,0)                          |                                   |  |  |  |  |  |
|                     | 2400                                 | 29,2-31,8 (28,2-32,8)                          |                                   |  |  |  |  |  |
|                     | 2100                                 | 29,9-32,3 (28,8-33,4)                          |                                   |  |  |  |  |  |
|                     | 1400                                 | 27,5-29,5 (26,2-30,8)                          |                                   |  |  |  |  |  |
|                     | 1000                                 | (26,0-30,6)                                    |                                   |  |  |  |  |  |
|                     | 600                                  | 25,7-28,7 (24,2-30,2)                          |                                   |  |  |  |  |  |
| switch-off          |                                      |  |                                   |  |  |  |  |  |
|                     | 2400                                 | 0  |                                   |  |  |  |  |  |
| Idle stop           | 650                                  | max. 1,0                                       |                                   |  |  |  |  |  |
|                     | 600                                  | 0,2-5,2  |                                   |  |  |  |  |  |
|                     | 425                                  | (4,0-12,0)                                     |                                   |  |  |  |  |  |
| End stop            | 330                                  | min. 30.0                                      |                                   |  |  |  |  |  |
| Ello stop           | 500                                  | max. 29,0                                      |                                   |  |  |  |  |  |
| 2 4 Solenoid        | max cut-in voltag                    | xxx min. 10 V<br>rated voltage 12V             | •                                 |  |  |  |  |  |

| 3. Dime: | 1SIONS tor assembly and adjustment   mm |
|----------|---|
|          |   |
| к        | 3,2-3,4                                 |
| KF       | 5,7-5,9                                 |
| MS ·     | 1,2-1,4                                 |
| svs      | 2,8                                     |
|          |   |
| ^XK      | 18,7-20,7                               |
| BXL      | 9,5-12,8                                |

Please note instructions on sheet 2.

H18

#### 2.1 Timing device

| n = min/1 | mm                             | Expansion element |
|-----------|--------------------------------|-------------------|
| 600       | 0,7-1,5 (0,4-1,8)              | 12 V              |
| 1000      | 2,3-3,1 (2,0-3,4)              | 12 V              |
| 1400      | 2,3-3,1 (2,0-3,4)<br>(3,6-5,0) | 12 V              |
| 2000      | 6,3-7,1 (6,0-7,4)              | 12 V              |
| 2100      | 6,7-7,5 (6,4-7,8)              | 12 V              |
| 2400      | 7,0-7,7 (6,6-8,0)              | 12 V              |

Testing the hydr. cold-start accelerator:

Apply 12 V to expansion element of hydr. cold-start accelerator. At 300 1/min there must be a timing-device travel of 1.3 - 3.3 mm.

77. \$

(1)

(5) 2>

WPP 001/4 IHC 6.6i

3. Edition

Overflow temperature 45° C

VE 6/12 F 1100 R 102 0 460 426 025

DHK 1 688 901 020 172 + 3 bar

supersedes. 83 company IHC engine. DT 402

All test specifications are valid only for Bosch Fuel-injection Pump Test Benches and Testers

Test Instructions and Test Equipment

| Pre | -stroke | setting |
|-----|---------|---------|

| 0,2 | mm |
|-----|----|
|-----|----|

+0,02(0,04)

see VDT-W-460/

| 1. Settings                                    | Rot speed rev/min | Settings   |                               | Charge-air press.<br>bar (kgf/cm²) | Difference in delivery cm <sup>3</sup> |
|--|-------------------|------------|-------------------------------|------------------------------------|--|
| 1 1 Timing device travel                       | 600               | 3,2 - 3,6  | mm                            | 0,75                               |  |
| 1 2 Supply-pump pressure                       | 600               | 5,0 - 5,6  | bar (kgf/cm²)                 | 0,75                               |  |
| 1.3 Full-load delivery with                    | 800               | 99,0-100,0 | cm³/1000 strokes              | 0,75                               | 3,5 (4,0                               |
| charge-air pressure Full-load delivery without | 600               | 81,0-83,0  | cm <sup>3</sup> /1000 strokes | 0                                  |  |
| charge-air pressure                            | 375               | 20,0-26,0  | cm <sup>3</sup> /1000 strokes | 0                                  |  |
| 1.5 Full-speed regulation                      | 1200              | 33,0-39,0  | cm³/1000 strokes              | 0,75                               | 3,5 (4,5                               |
| 1 6 Start                                      | 100               | min. 95    | cm <sup>3</sup> /1000 strokes | 0                                  |  |
| 1.7 Load dependent port-closing                |                   |            |                               |                                    |  |

| 2. Test Specifications checking values in brackets ( ) |                                      |                          |                  |                          |  |  |  |
|--|--------------------------------------|--------------------------|------------------|--------------------------|--|--|--|
| 21 Timing device<br>LDA=0,75 bar                       | n = rev/min<br>mm                    | 400<br>1,4-2,1 (1,0-2,4) | 600<br>(2,7-4,1) | 700<br>3,6-4,4 (3,3-4,7) |  |  |  |
| 2 2 Supply pump n = rev/min bar (kgf/cm²)              |                                      | 400<br>3,9-4,5 7,0       |                  | 1100<br>7,0 - 7,6        |  |  |  |
| Overflow delivery                                      | n = rev/min<br>cm <sup>3</sup> /10 s | 500<br>55-125 (40-140)   |                  | 1100<br>55-125 (40-140)  |  |  |  |

| 2 4 Solenoid                            | max cut-in voltage                           | xx min   | . 10,0 V<br>e 12V  |                                   |
|---|--|--|--|-----------------------------------|
| End stop                                | 200<br>440                                   | min. 95<br>max. 85                             |  |                                   |
| idle stop                               | 500<br>420<br>375                            | max. 1,5<br>min. 2,0                           |  |                                   |
| switch-off                              | 1100   | 0  | andrease and the second second second second second second second second second second second second second se |                                   |
| End stop                                | 1280<br>1220<br>1200<br>1080<br>800<br>600 * | max. 1,5<br>min. 2,0<br>95,0-98,0<br>88,5-90,5 | (31,0-41,0)<br>(93,5-99,5)<br>(96,5-102,5)<br>(85,7-93,3)<br>(78,2-85,8)                                       |                                   |
| 2 3 Fuel deliveries Speed control lever | Rot speed rev/min                            | Fuel delivery cm <sup>3</sup> /1000 strokes    |  | Charge-air press<br>bar (kgf/cm²) |
|   | Cm-710 S                                     | 55-125 (4                                      | U-14U)   |                                   |

| 3. Dimen Designation | SionS<br>tor assembly<br>and adjustment<br>mm |
|----------------------|---|
| K                    | -   |
| KF                   | 5,6-5,8                                       |
| MS                   | 1,5-1,7                                       |
| svs                  | max. 6,0                                      |
| <b>2</b> K           | 20,2-22,2                                     |
| ₽X L                 | 10,2-13,5                                     |

Manifold-pressure compensator stroke = 4,0 mm Correction at the adjusting nut. (46)

Geschaftsbereich KH. Kundendienst. Kfz. Ausrustung. 1980 by Robert Bosch GmbH, Postfach 50. D-7000 Stuttgart 1. Printed in the Federal Republic of Germany Imprimé en République Fédérale d'Allemagne par Robert Bosch GmbH.

**H20** 

8.84

WPP 001/4 VMA 2,4 d

1. Edition

4.7

VE 4/10 F 1900 L 106 0 460 404 026

Pre-stroke setting

Overflow temperature 45° C

supersederM Motori company HR 492 HT9

All test specifications are valid only for Bosch Fuel-injection Pump Test Benches and Testers mm

Test Instructions and Test Equipment

see VDT-W-460/.

| 1. Settings  | Rot speed rev/min | Settings    |                               | Charge-air press.<br>bar (kgf/cm²) | Difference in delivery cm <sup>3</sup> |
|--|-------------------|-------------|-------------------------------|------------------------------------|--|
|  | 1600              | 5,1 - 5,5   | mm                            | 0,75                               |  |
| 1.1 Timing device travel   | 1600              | 5,5 - 6,5   | bar (kgf/cm²)                 | 0,75                               |  |
| 1 2 Supply-pump pressure   | 1600              | 47,0 - 48,0 | cm <sup>3</sup> /1000 strokes | 0,75                               | 3,0 (3,5)                              |
| 1.3 Full-load delivery with<br>charge-air pressure<br>Full-load delivery without | 1600              | 31,0 - 34,0 | cm <sup>3</sup> /1000 strokes | 0                                  | •                                      |
| charge air pressure  1 4 Idle regulation   | 350               | 16,0 - 20,0 | cm <sup>3</sup> /1000 strokes | 0                                  | 2,5 (3,5)                              |
| 1.5 Full-speed regulation  | 1900              | 43,5 - 46,5 | cm1/1000 strokes              | 0,75                               |  |
| 1 6 Start  | 100               | min. 65     | cm <sup>3</sup> /1000 strokes | 0                                  |  |
| 1.7 Load-dependent port-closing  | į                 |             |                               |                                    |  |

| 2. Test Spe                    | cifications                          | checking values in brackets ( | )                 | Managements of 1. Volume 1.19 minut 1.500m reported to copy and report of contractable for desirable principal relating points 1.000m. |
|--------------------------------|--------------------------------------|-------------------------------|-------------------|--|
| 2 1 Timing device<br>LDA= 0,75 | n = rev/min                          | 1000<br>1,0-1,8 (0,7-2,1)     | 1600<br>(4,6-6,0) | 1900<br>6,5-7,5 (6,4-7,8)  |
| 2 2 Supply pump<br>LDA = 0,75  | n = rev/min<br>bar (kgf/cm²)         | 400<br>1,5 - 2,1              |                   | 1900<br>6,8 - 7,4  |
| Overflow delivery              | n = rev/min<br>cm <sup>3</sup> /10 s | 500<br>55-110 (40-125)        |                   | 1900<br>55-110 (40-125)  |
| 2 3 Fuel delivenes             |                                      | I                             |                   | 3. Dimensions for assembly and adjustment  |

| 2 3 Fuel delivenes  |   | is afficiency as some sources and a service service service service service in a service servi | *************************************** | 3. Dim               |
|---------------------|---|--|---|----------------------|
| Speed control lever | Rot speed rev/min                             | Fuel delivery<br>cm <sup>3</sup> /1000 strokes   | Charge air press<br>bar (kgf/cm²)       | Designation          |
| End stop            | 2100<br>2050<br>2030<br>1900<br>1600<br>* 750 | max. 1,0<br>min. 2,0<br>17,0 - 23,0 (16,0-24,0)<br>(41,0-49,0)<br>(29,8-35,2)<br>(44,8-50,2)<br>41,5 - 44,5 (40,0-46,0)  | 0,75<br>0<br>0,75                       | K<br>KF<br>MS<br>SVS |
| switch-off          | 600   | 32,0 - 35,0 (30,5-35,5)  | 0                                       | A<br>8               |
| idle stop           | 350<br>430                                    | (14,0-22, min. 2,5   | 0)                                      | Observatio           |
| End stop            | 500<br>350<br>450                             | max. 1,0<br>min. 48<br>max. 47,5   |   | *Mani<br>compe       |
| 2 4 Solenoid        | max cut-in volt                               | AAA 111111 10 10 1   |   | = 4,6                |

ons

ifold-pressure ensator stroke 2 mm

3.2 - 3.45.7 - 6.01,4 - 1,6

3,6

40

WPP 001/4 VMA 3,6 e

1. Edition

VE6/11/F1900L113

Overflow temperature 45° C

supersedes Motori VM Company HR 692 HT/9 engine

0 460 416 022

All test specifications are valid only for Bosch Fuel-injection Pump Test Benches and Testers

Test Instructions and Test Equipment

Pre-stroke setting

).2

± 0,02(0,04)

see VDT-W-460/

| 1. Settings                                     | Rot speed rev/min | Settings  |                               | Charge air press<br>bar (kgf/cm²) | Difference in delivery cm <sup>3</sup> |
|---|-------------------|-----------|-------------------------------|-----------------------------------|--|
| t t Turner device travel                        | 1500              | 4,7-5,3   | mm                            | 0,65                              |  |
| 1 1 Timing device travel                        | 1800              | 6,6-7,2   | bar (kgf/cm²)                 | 0,65                              |  |
| 1 2 Supply-pump pressure                        | 1500              | 47,5-48,5 | cm <sup>3</sup> /1000 strokes | 0,65                              | 2 5 (4 0)                              |
| 1 3 Full-load delivery with charge-air pressure | 600               | 36,0-40,0 | cm³/1000 strokes              | 0                                 | 3,5 (4,0)                              |
| Full-load delivery without charge air pressure  | 450               | 10,0-14,0 | cm <sup>3</sup> /1000 strokes | 0                                 |  |
| 1 4 Idle regulation                             | 2000              | 41,0-48,0 | cm <sup>3</sup> /1000 strokes | 0,65                              | 3,0 (4,0)                              |
| 1 5 Full-speed regulation 1 6 Start             | 100               | min. 42,0 | cm³/1000 strokes              | 0                                 |  |
| 1 7 Load-dependent port-closing                 | -                 |           |                               |                                   |  |

| 2. Test Spec                     | ifications                           | checking values in brackets ( | )                 |           | ann agu nàonn agus magair ann ann an dùth a t-t-aire an t-t-aire ann ann aireacht fainn. |
|----------------------------------|--------------------------------------|-------------------------------|-------------------|-----------|--|
| 2 1 Timing device<br>LDA=0.65 ba | n = fev/min<br>mm                    | 1000 2,1-2,9(1,8-3,2)         | 1500<br>(4,3-5,7) | 6,5-6,9   | 1800<br>(6,0-7,4)  |
| 2.2 Supply pump                  | n = rev/min                          | 400                           |                   |           |  |
| DA=0,65 bar                      | bar (kgf/cm²)                        | 1,7-2,3                       |                   |           |  |
| Overflow delivery                | n = rev/min<br>cm <sup>3</sup> /10 s | 400<br>55-138 (40-153)        |                   | 55-138 (4 | 1900<br>40-153)  |

| Speed control lever | Rot speed rev/min                             | Fuel delivery<br>cm <sup>3</sup> /1000 strokes   | Charge-air press<br>bar (kgt/cm²)            |
|---------------------|---|--|--|
| End stop            | 2200<br>2100<br>2000<br>1900<br>1500<br>* 600 | max 1,5<br>14,5-20,5(13,0-22,0)<br>(40,0-49,0)<br>45,2.47,8(43,9-49,1)<br>(45,4-50,6)<br>38,5-41,5(36,6-43,4)<br>(34,6-41,4) | 0,65<br>0,65<br>0,65<br>0,65<br>0,65<br>0,26 |
| switch-off          |   |  |  |
| Idle stop           | 700<br>550<br>450                             | max. 1,0<br>2,0-8,0(0,5-9,5)<br>(7,5-16,5)   |  |
| End stop            | 350<br>450                                    | min. 40,0<br>max. 45,0   |  |
| 2 4 Solenoid        | max cut-in volt                               | x rated voltage 12V.   | ,  |

| 3. Dimens Designation                | IONS<br>for assembly<br>and adjustment<br>mm        |
|--------------------------------------|---|
| K<br>MS<br>SVS<br>XK<br>XL<br>A<br>B | 6,4-6,6<br>0,9-1,1<br>2,4<br>20,2-22,2<br>11,9-15,2 |
|                                      | -pressure<br>or stroke                              |

BOSCI

WPP 001/4 PEU 2,3 k 3

1. Edition

VE 4/9 F 2075 R 126-1

Overflow temperature 45° C

supersedes

0 460 494 123

Test pressure line

companyPeugeot engine: XD 3 S

DHK: 1 688 901 022/130 bar

6x2x450 mm / 1 680 750 073

Test Instructions and Test Equipment

Pre-stroke setting

All test specifications are valid only for Bosch Fuel-injection Pump Test Benches and Testers mm

see VDT-W-460/

| 1. Settings  | Rot. speed | Settings  |                               | Charge-air press.<br>bar (kgf/cm²) | Difference in delivery cm <sup>3</sup> |
|--|------------|-----------|-------------------------------|------------------------------------|--|
|  | 1500       | 5,8-6,2   |                               | 0,8                                |  |
| 1 1 Timing device travel                           | 1500       | 5,6-6,2   | mm<br>bar (kgf/cm²)           | 0,8                                |  |
| 1 2 Supply-pump pressure                           | 500        | 42,8-43,8 | cm <sup>3</sup> /1000 strokes | 0                                  |  |
| 1 3 Full-load delivery with<br>charge air pressure | 1500       | 54,5-55,5 | cm³/1000 strokes              | 0,8                                | 2,5 (3,0)                              |
| Full-load delivery without<br>charge air pressure  | 400        | 17,0-21,0 | cm <sup>3</sup> /1000 strokes | 0                                  | 2,0 (3,0)                              |
| 1 4 Idle regulation                                |            |           | CIII-7 1000 SITURES           | i                                  |  |
| 1 5 Full-speed regulation                          | 2350       | 25,0-31,0 | cm <sup>3</sup> /1000 strokes | 0,8                                |  |
| 1 6 Start  | 100        | min. 57,0 | cm <sup>3</sup> /1000 strokes | 0                                  |  |
| 1 7 Load-dependent port-closing                    | -          |           |                               |                                    |  |

| 1 Timing device                         | n = rev/min                          | 750   | 1000                              | 1500                    | 2000                                |
|---|--------------------------------------|---|-----------------------------------|-------------------------|-------------------------------------|
| 1 1111111111111111111111111111111111111 | mm                                   | 0,8-1,6(0,5-1,9) 2,5-3                                      | ,3(2,7-3,6)                       | (5,3-6,7) 7             | ,8-8,6(7,5-8                        |
| ? 2 Supply pump                         | n = rev/min<br>bar (kgf/cm²)         | 200<br>1,4-2,0  | 750<br>3,4-4,0                    | 2000<br>7,1-7,          | 7                                   |
| Overflow delivery                       | n = rev/min<br>cm <sup>3</sup> /10 s | 500<br>55-138 (40-153)                                      |                                   | 2075<br>55-138 (40      |                                     |
| 2 3 Fuel deliveries                     | 1                                    |   |                                   | 3. Dimen                | for assembly                        |
| Speed control lever                     | Rot. speed rev/min                   | Fuel delivery cm <sup>3</sup> /1000 strokes                 | Charge-air press<br>bar (kgf/cm²) | Designation             | and adjustment<br>mm                |
| End stop                                | 2650<br>2350<br>2250                 | max. 1,0<br>(24,0-32,0)<br>37,0-43,0(36,0-44,0)             | 0,8<br>0,8<br>0,8                 | K                       | K1<br>5,4-5,7                       |
|   | 2000<br>1500<br>1000                 | 53,0-55,0(51,7-56,3)<br>(52,7-57,3)<br>52,0-55,0(50,5-56,5) | 0,8<br>0,8<br>0,8                 | MS<br>SVS               | 1,2-1,4                             |
|   | 750*<br>500                          | 48,7-49,7(46,2-52,2)<br>(40,3-46,3)                         | 0,25                              |                         | 4,0                                 |
| switch-off                              |                                      |   |                                   | A XK                    | 20,2-22,2                           |
| elektr.                                 | 400                                  | 0   |                                   | в ХГ                    | 9,3-12,6                            |
| idie stop                               | 400<br>450<br>500                    | (15,0-23,0)<br>4,5-9,5 (3,0-11,0)<br>max. 3,5               |                                   | Observations  Manifold- |                                     |
| End stop                                | 230<br>330                           | min. 60<br>max. 60  |                                   | = 4,5 mm<br>Correction  | or stroke<br>on at the<br>nut. (46) |
|   |                                      |   |                                   |                         |                                     |

...

WPP 001/4 SOF 2,5 K 1. Edition

VE 4/11F 1900 R 127 0 460 414 008

Test pressure line 6x2x450 mm / 1 680 750 073

+0,02(0,04)

company: Iveco -Sofim

engine 8140.21

DHK: 1 688 901 023 / 172 + 3 bar Overflow temperature 45° C

All test specifications are valid only for Bosch Fuel-injection Pump Test Benches and Testers

Test Instructions and Test Equipment

see VDT-W-460/...

0,3 · / mm Pre-stroke setting

| 1. Settings                                     | Rot speed rev/min | Settings                                 | Charge-air press.<br>bar (kgf/cm²) | Difference in delivery cm <sup>3</sup> |
|---|-------------------|--|------------------------------------|--|
|   | 1100              | 4,2 - 4,6 mm                             | 0,8                                |  |
| 1 1 Timing device travel                        | 1100              | 5,3 - 5,9 bar (kgf/cm²)                  | 0,8                                |  |
| 1 2 Supply pump pressure                        | 1100              | 45,5 - 46,5 cm3/1000 stroke              | s 0,8                              | 3,5 (4,0                               |
| 1 3 Full-load delivery with charge air pressure | 600               | 35,5 - 36,5 cm <sup>3</sup> /1000 stroke | s 0                                |  |
| Full-load delivery without charge air pressure  | 400               | 13,0 - 17,0 cm <sup>3</sup> /1000 stroke | os 0                               | 3,0 (4,0                               |
| 1 4 Idle regulation 1 5 Full-speed regulation   | 2200              | 18,0 - 24,0 cm <sup>3</sup> /1000 stroke | es 0,8                             |  |
|   | 100               | min. 60 cm <sup>3</sup> /1000 strok      | es 0                               |  |
| 1 6 Start 1 7 Load-dependent port closing       | 1100              | -  | 0,8                                |  |

| 2 1 Timing device n = rev/min                                  | 800               | 1100 1500 1900                        |
|--|-------------------|---------------------------------------|
| LDA = 0.8  barmm   2,4-3,2                                     | (2, 1-3, 5)       | (3,7-5,1) 5,8-6,6(5,5-6,9) 7,6-8,4(7, |
| 2 2 Supply pump n = rev/min  LDA = 0,8 bar bar (kgf/cm²) 3,8 - | 600<br>4.4        | 1900<br>7,5 - 8,1                     |
| Overflow delivery n = rev/min                                  | 600<br>8 (40-153) | 1900<br>55-138 (40-159)               |

| Speed control lever | Rot speed        | Fuel delivery<br>cm <sup>3</sup> /1000 strokes | Charge-air press<br>bar (kgf/cm²) |
|---------------------|------------------|--|-----------------------------------|
| End stop            |                  | 10.0   | 0.8                               |
|                     | 2350             | max. 10,0                                      | 5-25,5) 0,8                       |
|                     | 2000             | 30,0-38,0 (29,                                 |                                   |
|                     | 1900             | 40,15-42,65 (38,                               |                                   |
|                     | 1500             | 42,75-45,25 (41,                               |                                   |
|                     | 1100             |  | 4-48,6) 0,8                       |
|                     | 800              | 36,5-37,5 (34,                                 |                                   |
|                     | 600              |  | 6-39,4) 0                         |
| switch-off          |                  |  |                                   |
| idie stop           | 550              | max. 2,0                                       |                                   |
|                     | 400              |  | 5-19,5)                           |
|                     | 350              |  | 5-34,5)                           |
| End stop            | 200              | min. 55  |                                   |
| •<br>!              | 350              | max. 55  |                                   |
| 2 4 Solenoid        | max. cut-in volt | age xxx min. 10 Vc                             | \1†                               |

| 3. Dimen     | for assembly and adjustment mm |
|--------------|--------------------------------|
| K<br>KF      | 5,2-5,4                        |
| MS           | 0,9-1,1                        |
| svs          | 4,6                            |
| A            |                                |
| В            |                                |
| Observations |                                |

\*Manifold-pressure compensator stroke = 6.2 mm

Geschältsbereich KH. Kundendienst. Kfz. Ausrustung. 1980 by Robert Bosch GmbH, Postfach 50. D 7000 Stuttgart 1. Printed in the Federal Republic of Germany Imprimé en République Fédérale d'Allemagne par Robert Bosch GmbH.

WPP 001/4 REN 2,0 h

3. Edition

cm<sup>3</sup>/1000 strokes

Overflow temperature 45° C

2:84

supersedes REN company:

engine:

**185-234** 

0 460 494 128

Pre-stroke setting

1.6 Start

1.7 Load dependent port-closing

VE 4/9 F 2100 R 130

All test specifications are valid only for Bosch Fuel-injection Pump Test Benches and Testers

100

mm

Test Instructions and Test Equipment

see VDT-W-460/ .

| 1. Settings  | Rot speed rev/min | Settings  |                               | Charge-air press.<br>bar (kgf/cm²) | Difference in delivery cm <sup>3</sup> |
|--|-------------------|-----------|-------------------------------|------------------------------------|--|
|  | 1400              | 4,0-4,4   | mm                            | 0,8                                |  |
| 1 1 Timing device travel   | 1400              | 5,1-5,7   | bar (kgf/cm²)                 | 0,8                                |  |
| 1 2 Supply pump pressure   | 1400              | 46,7-47,7 | cm³/1000 strokes              | 0,8                                | (2,5 (3,0                              |
| S Full-load delivery with charge-air pressure     Full-load delivery without | 600               | 29,5-30,5 | cm <sup>3</sup> /1000 strokes | 0                                  |  |
| charge-air pressure  1 4 Idle regulation                                     | 375               | 4,0-8,0   | cm <sup>3</sup> /1000 strokes | 0                                  | 2,5 (3,0                               |
| 1.5 Full-speed regulation  | 2300              | 18,0-24,0 | cm <sup>3</sup> /1000 strokes | 0,8                                |  |

min. 50,0

| 2. Test Spe           | citications   | checking values in b                       | rackets ( )  |                  |                                  |  |
|-----------------------|---|--|--|------------------|----------------------------------|--|
| 2 1 Timing device     | n = rev/min   | 1000<br>1,9-2,7(1,0                        | 1400<br>5-3,0)(3,5-4,9   | 180<br>5,8-6,6 ( |                                  | 000<br>-6,9(5,8-7,   |
| 2 2 Supply pump       | n = rev/min<br>bar (kgf/cm²)                          | 400<br>1,9-2,                              |  |                  | 1800<br>6,3-6,9                  | na mayay alaga asgallan gagallaya aya a dalahadayanna a dalahada |
| Overflow delivery     | n = rev/min<br>cm <sup>3</sup> /10 s                  | 500<br>55-138 (4                           | 40-153)  | 55               | 2100<br>5-138 (40-15             | 3)   |
| 2 3 Fuel deliveries   | i Rot. speed  | Fuel delivery                              |  | Charge air press | 3. Dimen Designation             | Sions for assembly and adjustment mm                             |
| End stop              | 2600<br>2400<br>2300<br>2000<br>1400<br>1000<br>700 * | max. 2,0<br>max. 14,0<br>39,9-42,9         | (44,9-49,5)<br>(41,1-47,1)   | 0,8              | K<br>KF<br>MS<br>SVS             | 3,2-3,4<br>5,7-6,0<br>1,4-1,6<br>5,5                             |
| switch-off<br>elektr. | 400   | 0  | entre e continue e - migra repuesta e una escuente e comunidad e comunidad e continue e continue de continue e |                  | B XL                             | 7,7-11,0   |
| Idle stop End stop    | 350<br>375<br>480<br>170<br>300                       | 9,0-13,0<br>max. 2,0<br>min. 40<br>max. 40 | (7,0-15,0)<br>(2,0-10,0)   |                  | compensa<br>= 4,5 mm<br>Correcti | -pressure<br>tor stroke<br>on at the<br>g nut. (46)              |

2 4 Solenoid

max. cut-in voltage

xxxx min. 10 V

1944 Weeke rated voltage 12V

46

WPF 001/4 REN 2,0 m

1. Edition

VE 4/9 F 2100 R 130 - 1 Overflow temperature 45° C 0 460 494 157

supersedes company: Renault

All test specifications are valid only for Bosch : uel-injection Pump Test Benches and Testers

Test Instructions and Test Equipment

see VDT-W-460/...

| Pre-stroke setting                                    | mm                |           |                               | see VDT-W-460/                     |  |
|---|-------------------|-----------|-------------------------------|------------------------------------|--|
| 1. Settings   | Rot speed rev/min | Settings  |                               | Charge-air press.<br>bar (kgf/cm²) | Difference in delivery cm <sup>3</sup> |
| 1.1 Timing device travel                              | 1400              | 4,0 - 4,4 | mm                            | 8,0                                |  |
|   | 1400              | 5,1 - 5,7 | bar (kgf/cm²)                 | 0,8                                |  |
| 1 2 Supply-pump pressure  1 3 Full-load delivery with | 1400              | 46,7-47,7 | cm³/1000 strokes              | 8,0                                | 2,5 (3,0                               |
| charge-air pressure Full-load delivery without        | 600               | 29,5-30,5 | cm <sup>3</sup> /1000 strokes | 0                                  |  |
| charge-air pressure                                   | 375               | 4,0-8,0   | cm <sup>3</sup> /1000 strokes | 0                                  | 2,5 (3,0                               |
| 1.5 Full-speed regulation                             | 2300              | 18,0-24,0 | cm³/1000 strokes              | 0,8                                |  |
| 1 6 Start   | 100               | min. 50   | cm <sup>3</sup> /1000 strokes | 0                                  |  |
| 1.7 Load-dependent port-closing                       |                   |           |                               | 1                                  |  |

| 2. Test Spec      | ifications            | checking values in brackets ( | )                |                      |          |          |
|-------------------|-----------------------|-------------------------------|------------------|----------------------|----------|----------|
| 2 1 Timing device | n = rev/min           | 1000<br>1,9-2,7 (1,6-3,0)     | 1400             | 1800<br>5 8-6 6/5 5- | 2000     | 9(5.8-7. |
| LDA = 0,8 bar     | n = rev/min           | 400                           | (3,3-4,3)        | 180                  |          | 31010    |
| LDA = 0.8 bar     | bar (kgf/cm²)         | 1,9 - 2,5                     |                  | 6,3 -                | 6,9      |          |
| Overflow delivery | n = rev/min           | 500                           | 4533             | _                    | 2100     |          |
|                   | cm <sup>1</sup> /10 s | 55-138 (40-                   | 153 <i>)</i><br> |                      | (40-153) |          |

| Speed control lever | Rot speed         | Fuel delivery   | Charge-air press. |
|---------------------|-------------------|---|-------------------|
|                     | rev/min           | cm <sup>3</sup> /1000 strokes   | bar (kg1/cm²)     |
| End stop            | 2600              | max. 2,0  | 0,8               |
|                     | 2400              | max. 14,0   | 8,0               |
|                     | 2300              | (17,0 - 25  | ,0) 0,8           |
|                     | 2000              | 39,9-42,9 (39,1- 43<br>(44,9 - 49   | r \ 0 0           |
|                     | 1400              | 42,6-45,6 (41,1- 47<br>35,3-36,3 (33,5 - 38   | ,1) 0,8           |
|                     | * 700             | 35 3-36.3 (33.5 - 38  | ,1) 0,2           |
|                     | 600               | (27,7 - 32  | ,3) 0             |
|                     |                   |   |                   |
| switch-off          |                   | a de la company |                   |
| elektr.             | 400               | 0   |                   |
|                     |                   |   |                   |
| ldle stop           | 350               | 9,0 - 13,0 (7,0 - 15<br>(2,0 - 10   | ,0)               |
|                     | 375               | (2,0 - 10   | ,0)               |
|                     | 480               | max. 2,0  |                   |
| End stop            | 170               | min. 40   |                   |
|                     | 900               | max. 40   |                   |
| 2 4 Solenoid        | max. cut-in volta | 90 xx min. 10 V   |                   |
|                     | test voltage      | rated voltage 12V.  |                   |

| 5-138 (40-           | 1337  |
|----------------------|---|
| 3. Dimen Designation | Sions<br>for assembly<br>and adjustment<br>mm |
| K<br>KF<br>MS<br>SVS | 3,1 - 3,4<br>5,7 - 6,0<br>1,4 - 1,6<br>3,6    |
|                      | ld-pressure<br>ator stroke                    |

**Test Specifications** 

Distributor-type Fuel-injection Pumps

WPP 001/4 VWW 1,6 V 5

3. Edition

Overflow temperature 45° C

supersedes 12.83

company: VWW engine: 086 T

VE 4/9 F 2250 R 134-1

0 460 494 134

All test specifications are valid only for Bosch Fuel-injection Pump Test Benches and Testers

Test Instructions and Test Equipment

see VDT-W-460/ .

mm Pre-stroke setting

| 1. Settings                                       | Rot. speed rev/min | Settings  |                               | Charge-air presc<br>bar (kgf/cm²) | Difference in delivery cm <sup>3</sup> |
|---|--------------------|-----------|-------------------------------|-----------------------------------|--|
| 1 1 Timing device travel                          | 1500               | 3,3-3,7   | mm                            | 0,75                              |  |
| 1 2 Supply-pump pressure                          | 1500               | 4,6-5,2   | bar (kgf/cm²)                 | 0,75                              |  |
| 1 3 Full-load delivery with                       | 1500               | 42,5-43,5 | cm <sup>3</sup> /1000 strokes | 0,75                              | 2,5 (3,0)                              |
| charge air pressure<br>Full-load delivery without | 600                | 22,5-23,5 | cm <sup>3</sup> /1000 strokes | 0                                 |  |
| charge air pressure<br>1 4 Idle regulation        | 450                | 6,0-10,0  | cm <sup>3</sup> /1000 strokes | 0                                 | 2,0 (3,0)                              |
| 1 5 Full-speed regulation                         | 2525               | 9,0-15,0  | cm <sup>3</sup> /1000 strokes | 0,75                              |  |
| 1 6 Start   | 100                | min. 35   | cm <sup>3</sup> /1000 strokes | 0                                 |  |
| 1.7 Load-dependent port-closing                   |                    |           |                               |                                   |  |

| 2. Test Spec                      | cifications                  | checking values in brackets ( | )                 | a selection of the sele |
|-----------------------------------|------------------------------|-------------------------------|-------------------|--|
| 2 1 Timing device<br>LDA=0,75 bar | n = rev/min<br>mm            | 1000<br>1,3-2,1 (1,0-2,4)     | 1500<br>(2,8-4,2) | 2250<br>6,0-6,8 (5,7-7,1)  |
| 22 Supply pump<br>LDA=0,75 bar    | n = rev/min<br>bar (kgf/cm²) | 600<br>2,5 - 3,1              |                   | 2250<br>6,5-7,1  |
| Overflow delivery                 | n = rev/min<br>cm³/10 s      | 600<br>55-138 (40-153)        |                   | 2250 (0,75 bar)<br>55-138 (40-153)   |
|                                   |                              |                               |                   | O Dimensions   |

|                     |  | 33-130 (40                                  | - 100/   |                                   |
|---------------------|--|---|--|-----------------------------------|
| 2 3 Fuel deliveries | and the second s |   |  |                                   |
| Speed control lever | Rot speed rev/min  | Fuel delivery cm <sup>3</sup> /1000 strokes | and the same and t | Charge-air press<br>bar (kgf/cm²) |
| End stop            |  |   |  |                                   |
|                     | 2750   | max. 3,0                                    |  | 0,75                              |
|                     | 2525   | ļ   | (8,0-16,0)   |                                   |
|                     | 2250   | 37,5-39,5                                   | (36,2-40,8)  | 0,75                              |
|                     | 1500   |   | (40,8-45,2)  | 0,75                              |
|                     | 1000 *   | 32,5-33,5                                   | (30,8-35,2)  | 0,3                               |
|                     | 600  |   | (20,0-26,0)  | 0                                 |
|                     |  |   |  |                                   |
| switch-off          |  | į   |  |                                   |
| mech.               | 2250   | 0   |  |                                   |
| elektr.             | 400  | 0   |  |                                   |
| idle stop           |  |   |  |                                   |
| .G.C 510p           | 450  |   | (4,0-12,0)   |                                   |
|                     | 1200   | max. 9,0                                    |  |                                   |
| End etan            | 400  | min. 21,0                                   |  |                                   |
| End stop            | 500  | max. 29,0                                   |  | 1                                 |
|                     |  |   |  |                                   |
| 2 4 Solenoid        | max. cut-in volta  | ge xxx min.                                 | 10.0 V   |                                   |
|                     | test voltage   | rated volta                                 |  |                                   |

| 3. Dimen | ior assembly<br>and adjustment<br>mm |
|----------|--------------------------------------|
| к        |                                      |
| KF       | 3,2 - 3,4<br>5,7 - 6,0               |
| MS       | 1,2 - 1,4                            |
| svs      | 5,7                                  |
|          |                                      |
| A        |                                      |
| XK       | 18,4 - 20<br>10,1- 13                |
| XL       | 10,1- 13                             |

Manifold-pressure compensator stroke = 4,0 mm Correction at the adjusting nut. (46)

Geschaftsbereich KH. Kundendienst. Kfz-Ausrustung.
1980 by Robert Bosch GmbH, Postfach 50, D-7000 Stuttgart 1. Printed in the Federal Republic of Germany Imprimé en République Fédérale d'Altemagne par Robert Bosch GmbH.

4.2.

### Test Specifications Distributor-type Fuel-injection Pumps

46

WPP 001/4 VWW 1,6 V 6 3. Edition

En

VE 4/9 F 2250 R 134-2 O 460 494 135 Overflow temperature 45° C

supersedes VWW company: engine 086 T

All test specifications are valid only for Bosch Fuel-Injection Pump Test Benches and Testers

Test Instructions and Test Equipment

see VDT-W-460/...

| 1. Settings  | Rot. speed rev/min | Settings    |                               | Charge-air press.<br>bar (kgf/cm²) | Difference in delivery cm <sup>3</sup> |
|--|--------------------|-------------|-------------------------------|------------------------------------|--|
| *  | 1500               | 3,3 - 3,7   | mm                            | 0,75 bar                           |  |
| 1.1 Timing device travel   | 1500               | 4,6 - 5,2   | bar (kgf/cm²)                 | 0,75                               |  |
| 1 2 Supply-pump pressure   | 1500               | 42,5 - 43,5 | cm <sup>3</sup> /1000 strokes | 0,75                               | 2,5 (3,0)                              |
| 1.3 Full-load delivery with<br>charge-air pressure<br>Full-load delivery without | 600                | 22,5 - 23,5 | cm³/1000 strokes              | 0                                  |  |
| charge air pressure  1 4 Idle regulation   | 475                | 6,0 - 10,0  | cm <sup>3</sup> /1000 strokes | 0                                  | 2,0 (3,0)                              |
| t 5 Full-speed regulation  | 2525               | 9,0 - 15,0  | cmV1000 strokes               | 0,75                               |  |
| 1 6 Start  | 100                | min. 35     | cm³/1000 strokes              | 0                                  |  |
| 1 7 Load-dependent port-closing  | _                  |             |                               |                                    |  |

| 2. Test Spec              | cifications                                   | checking values in brackets (  | )                                 |                                 |  |
|---------------------------|---|--|-----------------------------------|---------------------------------|--|
| 1 Timing device           | n = rev/min                                   | 1000   | 1500                              |                                 | 2250   |
| LDA = 0.75 ba             | מושון   | 1,3-2,1 (1,0-2,4)  | (2,8-4,2                          | (2,8-4,2) 6,0-6,8 (5,7-         |  |
| 2 2 Supply pump           | n = rev/min                                   | 600  |                                   |                                 | 2250   |
| LDA = 0.75 bi             | bar (kgf/cm²)                                 | 2,5-3,1  |                                   | 6,                              | 5-7,1  |
| Overflow delivery         | n = rev/min<br>cm <sup>3</sup> /10 s          | 600<br>55-138 (40-153)   | 1                                 | 55-138                          | 2250<br>(40-153)   |
| 2 3 Fuel deliveries       |   |  |                                   | 3. Dimer                        | 1SIONS<br>for assembly<br>and adjustment                   |
| Speed control lever       | Rot. speed<br>rev/min                         | Fuel delivery<br>cm <sup>3</sup> /1000 strokes   | Charge-air press<br>bar (kgf/cm²) | Designation                     | mm   |
| End stop                  | 2750<br>2525<br>2250<br>1500<br>* 1000<br>600 | max. 3,0<br>(8,0-16,<br>37,5-39,5 (36,2-40,<br>(40,8-45,<br>32,5-33,5 (30,8-35,<br>(20,0-26, | (8) 0,75<br>(2) 0,75<br>(2) 0,3   | K<br>KF<br>MS<br>SVS            | 3,2 - 3,4<br>5,7 - 6,0<br>1,2 - 1,4<br>3,2                 |
| switch-off<br>elektr.     | 400   | 0  |                                   | XK<br>B<br>XL                   | 18,4 - 20,<br>9,4 - 12,                                    |
| Idle stop                 | 475<br>1200                                   | (4,0-1<br>max. 4,0   | 12,0)                             | Observations  Manage 603        | Lavossupo  |
| End stop                  | 400<br>500                                    | min. 21,0<br>max. 29,0   |                                   | compensa<br>= 4,0 m<br>Correcti | l-pressure<br>tor stroke<br>m<br>on at the<br>ig nut. (46) |
| 2 4 So <del>le</del> noid | max. cut-in voltage                           | XXX IIIII 10,0 1   |                                   | a a just iii                    |  |

40

WPP 001/4 VWW 2,4 n 1. Edition

En

VE 6/10 F 2400 L 135

0 460 406 026

As of FD 444 note page 2.

supersedes company VWW

engine: 087T - V01

#### Overflow temperature 45° C

All test specifications are valid only for Bosch Fuel-injection Pump Test Benches and Testers

Test Instructions and Test Equipment

see VDT-W-460/...

| 1. Settings   | Rot speed rev/min | Settings  |                               | Charge-air press.<br>bar (kgf/cm²) | Difference in delivery cm <sup>3</sup> |
|---|-------------------|-----------|-------------------------------|------------------------------------|--|
| ,   | 1500              | 1,5- 1,9  | mm                            | 1,3                                |  |
| 1.1 Timing device travel  | 1500              | 5,7- 6,3  | bar (kgf/cm²)                 | 1,3                                |  |
| 1 2 Supply pump pressure  | 1500              | 44,0-45,0 | cm <sup>3</sup> /1000 strokes | 1,3                                | 2,5(3,0)                               |
| 1 3 Full-load delivery with charge-air pressure                     | 700               | 24,0-25,0 | cm³/1000 strokes              | 0                                  |  |
| Full-load delivery without charge-air pressure  1 4 Idle regulation | 415               | 6,0-10,0  | cm³/1000 strokes              | 0                                  | 2,0(3,0)                               |
| 1 5 Full-speed regulation   | 2675              | 10,0-16,0 | cm <sup>3</sup> /1000 strokes | 1,3                                |  |
| 1 6 Start   | 100               | min. 42,0 | cm <sup>3</sup> /1000 strokes | 0                                  |  |
| 1 7 Load-dependent port-closing                                     |                   |           |                               |                                    |  |

| 2 1 Timing device                       | n = rév/min<br>mm                                     |                     | siehe Blatt 2  |                      |   |
|---|---|---------------------|--|----------------------|---|
| 22Supply pump<br>LDA=1,3 bar            | n = rev/min<br>bar (kgf/cm²)                          | 600<br>3,3-3,9      | 1500*<br>6,8-7,4   | 240<br>7,8-          |   |
| Overflow delivery                       | n = rev/min<br>cm³/10 s                               | 600<br>55-138 (40-1 |  | 100<br>3 (40-153)    |   |
| 2 3 Fuel deliveries Speed control lever | Rot. speed  | Fuel delivery       | Charge-air press<br>bar (kgf/cm²)                              | 3. Dimen             | sions for assembly and adjustment mm      |
| End stop                                | 2825<br>2675<br>2400<br>1500<br>1000<br>700<br>600 ** | 37,0-38,0 (35,2     | -38,3)<br>-46,8)<br>-39,8)<br>-27,5)<br>1,3<br>1,3<br>0,7<br>0 | K<br>KF<br>MS<br>SVS | 3,2-3,4<br>6,3-6,6<br>1,7-1,9<br>max. 5,9 |
| switch-off                              |   |                     |  | A                    |   |
| elektr.                                 | 400   | <b>o</b>            |  |                      |   |
| Idle stop                               | 750<br>415<br>400                                     | max. 3,0<br>(4,0-   | 12,0)  |                      | note instruc:<br>n sheet 2                |
|   | 500   | max. 26,0           |  |                      |   |

#### 2.1 Timing device

| $n = min^{-1}$ | ALDA    | Solenoid valve | mm                |
|----------------|---------|----------------|-------------------|
| 1200           | 1.3 bar | 12 V           | 0.0-0.8 (0.0-1.1) |
| 1200           | 1.3 bar | 0 V            | 1.5-2.7 (1.4-2.8) |
| 1500           | 1.3 bar | 12 V           | (1.0-2.4)         |
| 1500           | 1.3 bar | 0 V            | 3.2-4.2 (3.0-4.4) |
| 2400           | 1.3 bar | 12 V           | 5.4-6.2 (5.1-6.5) |

#### Adjust EGR with a gauge

| n = min <sup>-1</sup> ALDA |       | Solenoid valve | Fuel delivery cm <sup>3</sup> / 1000 strokes |  |
|----------------------------|-------|----------------|--|--|
| 1000                       | 0 bar | 12 V           | 13.0-15.0                                    |  |

#### as of FD 444:

#### 2.3 Fuel deliveries

| n = min <sup>-1</sup> | ALDA - | Fuel delivery cm³ / 1000 strok?s |
|-----------------------|--------|----------------------------------|
| 2825                  | 1.3    | max. 6.0                         |
| 2675                  | 1.3    | 10.0-16.0 (9.0-17.0)             |
| 2400                  | 1.3    | 35.0-37.0 (33.7-38.3)            |
| 1500                  | 1.3    | 44.0-45.0 (42.2-46.8)            |
| 1000**                | 0.7    | 37.0-38.0 (35.2-39.8)            |
| 600                   | 0      | 25.5-26.5 (23.0-29.0)            |

#### End stop

| $n = min^{-1}$ | ALDA | Fuel delivery cm³ / 1000 strokes |
|----------------|------|----------------------------------|
| 400            | 0    | min. 20.0                        |
| 500            | 0    | max. 30.0                        |

<sup>\*\*</sup> ALDA-stroke = 7.5 mm

<sup>\* 0</sup> V at the solenoid valve. Do not activate the cold-start accelerator lever when checking starting fuel delivery.

WPP 001/4 VWW 2,4 n 1 1. Edition

VE 6/10 F 2400 L 135 - 1

0 460 406 028

Pre-stroke selling

As of FD 444 note page 2.

company 087 T - Vol

Overflow temperature 45° C

All test specifications are valid only for Bosch Fuel-injection Pump Test Benches and Testers mm

Test Instructions and Test Equipment

see VDT-W-460/...

| 1. Settings  | Rot. speed rev/min | Settings  |                               | Charge-air press.<br>bar (kgf/cm²) | Difference in delivery cm <sup>3</sup> |
|--|--------------------|-----------|-------------------------------|------------------------------------|--|
|  | 1500               | 1,5-1,9   | mm                            | 1,3                                |  |
| 1 1 Timing device travel   | 1500               | 5,7- 6,3  | bar (kgf/cm²)                 | 1,3                                |  |
| 1 2 Supply-pump pressure   | 1500               | 44,0-45.0 | cm <sup>3</sup> /1000 strokes | 1,3                                | 2,5 (3,0                               |
| 1 3 Full-load delivery with<br>charge-air pressure<br>Full-load delivery without | 700                | 24,0-25,0 | cm³/1000 strokes              | 0                                  |  |
| charge-air pressure  | 415                | 6,0-10,0  | cm <sup>3</sup> /1000 strokes | 0                                  | 2,0 (3,0                               |
| 1 5 Full-speed regulation  | 2675               | 10,0-16,0 | cm³/1000 strokes              | 1,3                                |  |
| 1 6 Start  | 100                | min. 42,0 | cm³/1000 strokes              | 0                                  |  |
| 1.7 Load-dependent port-closing  | _                  |           |                               |                                    |  |

| 2 1 Timing device                       | n = rev/min  |   | siehe Blatt 2                 |                      |  |  |  |
|---|--|---|-------------------------------|----------------------|--|--|--|
| 22Supplypump<br>ALDA=1,3 bar            | n = rev/min<br>bar (kgf/cm²)                         | 600<br>3,3-3,9  | 1500*<br>6,8-7,4              | 240<br>7,8-8         | -  |  |  |
| Overflow delivery                       | n = rev/min<br>cm <sup>3</sup> /10 s                 | 600<br>55-138 (40-153)  | 2400<br>55-138 (4             | 10-153)              |  |  |  |
| 2 3 Fuel deliveries Speed control lever | Rot speed  | i Jel delivery  | Charge-air press              | 3. Dimer             | tor assembly<br>and adjustment<br>mm     |  |  |
| End stop                                | 2825<br>2675<br>2400<br>1500<br>1000<br>700<br>600** | max. 6,0<br>( 9,0-17,0<br>35,0-37,0(33,7-38,3<br>(42,2-46,8<br>37,0-38,0(35,2-39,8<br>(21,5-27,5<br>21,2-24,8(20,0-26,0 | 1,3<br>1,3<br>1,3<br>0,7<br>0 | K<br>KF<br>MS<br>SVS | 3,2-3,4<br>6,3-6,6<br>1,7-1,9<br>max.5,9 |  |  |
| switch-off<br>elektr.<br>mech.          | 400<br>2400  | 0<br>0  |                               | 8                    |  |  |  |
| End stop                                | 750<br>415<br>400<br>500                             | max. 3,0<br>(4,0-12,0)<br>min. 16,0<br>max. 26,0  |                               |                      | note instruc<br>on sheet 2               |  |  |
| 2 4 Solenoid                            | mar cut-in volta                                     | * * * * * * * * * * * * * * * * * * *   |                               |                      |  |  |  |

#### 2.1 Timing device

| n = min <sup>-1</sup> | ALDA    | Solenoid valve | mm                |
|-----------------------|---------|----------------|-------------------|
| 1200                  | 1.3 bar | 12 V           | 0.0-0.8 (0.0-1.1) |
| 1200                  | 1.3 bar | 0 V            | 1.5-2.7 (1.4-2.8) |
| 1500                  | 1.3 bar | 12 V           | (1.0-2.4)         |
| 1500                  | 1.3 bar | 0 V            | 3.2-4.2 (3.0-4.4) |
| 2400                  | 1.3 bar | 12 V           | 5.4-6.2 (5.1-6.5) |

#### Adjust EGR with a gauge

| $n = min^{-1}$ | ALDA  | Solenoid valve | Fuel delivery cm <sup>3</sup> / 1000 strokes | _ |
|----------------|-------|----------------|--|---|
| 1000           | 0 bar | 12 V           | 13.0-15.0                                    |   |

#### as of FD 444:

#### 2.3 Fuel deliveries

| n = min <sup>-1</sup> | ALDA | Fuel delivery cm³ / 1000 strokes |
|-----------------------|------|----------------------------------|
| 2825                  | 1.3  | max. 6.0                         |
| 2675                  | 1.3  | 10.0-16.0 (9.0-17.0)             |
| 2400                  | 1.3  | 35.0-37.0 (33.7-38.3)            |
| 1500                  | 1.3  | 44.0-45.0 (42.2-46.8)            |
| 1000**                | 0.7  | 37.0-38.0 (35.2-39.8)            |
| 600                   | 0    | 25.5-26.5 (23.0-29.0)            |

#### **End** stop

| $n = min^{-1}$ | ALDA | Fuel delivery cm³ / 1000 strokes |
|----------------|------|----------------------------------|
| 400            | 0    | min. 20.0                        |
| 500            | 0    | max. 30.0                        |

<sup>\*\*</sup> ALDA-stroke = 7.5 mm

<sup>\* 0</sup> V at the solenoid valve. Do not activate the cold-start accelerator lever when checking starting fuel delivery.

WPP 001/4 VWW 1,6 W8 1. Edition

VE 4/9 F 2400 R 136-1 0 460 494 166

Overflow temperature 45° C

086-1,6 L

All test specifications are valid only for Bosch Fuel-injection Pump Test Benches and Testers

Test Instructions and Test Equipment

Pre-stroke setting

see VDT-W-460/...

| 1. Settings  | Rot speed rev/min | Settings               |   | Charge-air press.<br>bar (kgf/cm²) | Difference in delivery cm <sup>3</sup> |
|--|-------------------|------------------------|---|------------------------------------|--|
| 1 1 Timing device travel 1 2 Supply-pump pressure  | 1500<br>1500<br>- | 2,4-2,8<br>4,3-4,9     | mm<br>bar (kgf/cm²)   |                                    |  |
| 1 3 Full-load delivery with charge-air pressure Full-load delivery without charge-air pressure | 1500<br>450       | 32,0-33,0<br>6,0-10,0  | cm <sup>3</sup> /1000 strokes<br>cm <sup>3</sup> /1000 strokes<br>cm <sup>3</sup> /1000 strokes |                                    | 2,5 (3,0)<br>2,0 (3,0)                 |
| 1 5 Full-speed regulation 1 6 Start  | 2600<br>100       | 11,0-17,0<br>min. 35,0 | cm <sup>3</sup> /1000 strokes<br>cm <sup>3</sup> /1000 strokes                                  |                                    |  |
| 1 7 Load-dependent port-closing  | -                 |                        |   |                                    |  |

|                     | 1                                    |                                 |                                    |                    | <u> </u>             |
|---------------------|--------------------------------------|---------------------------------|------------------------------------|--------------------|----------------------|
| 2. Test Spe         | cifications                          | checking values in brackets ( ) |                                    |                    |                      |
| 1 Timing device     | n = rev/min                          | 1000 0,6-1,4(0,3-1,7)           | 1500<br>(1,9-3,3)                  | 5,8-6,6            | 2400<br>(5,5-6,9)    |
| 2 Supply pump       | n = rev/min<br>bar (kgf/cm²)         | 600<br>2,2-2,8                  | 2400<br>6,4-7,0                    |                    |                      |
| Overflow delivery   | n = rev/min<br>cm <sup>3</sup> /10 s | 600<br>44-138(40-153)           | 55-1                               | 2400<br>38(40-153) |                      |
| 3 Fuel deliveries   |                                      |                                 |                                    | 3. Dimens          | for assembly         |
| Speed control lever | Rot. speed<br>rev/min                | Fuel delivery cm³/1000 strokes  | Charge-air press.<br>bar (kgf/cm²) | Designation        | and adjustment<br>mm |
| End stop            | 2800<br>2600                         | max. 3,0 (10,0-18,0             |                                    | к                  | 3,3                  |

| 2 3 Fuel deliveries   |                                     |   | 3. Dii      |
|-----------------------|-------------------------------------|---|-------------|
| Speed control lever   | Rot. speed<br>rev/min               | Fuel delivery Charge-air press. cm³/1000 strokes bar (kg1/cm²)              | Designation |
| End stop              | 2800<br>2600<br>2400<br>1500<br>600 | max. 3,0<br>(10,0-18,0<br>27,3-29,3<br>(30,2-34,8)<br>21,5-24,5 (20,0-26,0) | KF MS SVS   |
| switch-off<br>elektr. | 400                                 | 0   | A<br>B      |
| idle stop             | 1200<br>600<br>450<br>400           | max. 6,0<br>max. 7,0<br>(4,0-10,0)  | Observati   |
| End stop  24 Solenoid | 500                                 | max. 23,5   |             |

| 3,3<br>5,7-5,9<br>1,3-1,5<br>2,5 |
|----------------------------------|
|                                  |
|                                  |
|                                  |

J9

6

## **Test Specifications** Distributor-type Fuel-injection Pumps

WPP 001/4 VWW 2,0 i 3

2. Edition

VE 5/10 F 2400 L 137

Overflow temperature 45° C

7.83 supersedes VWW company: 153

0 460 405 030

engine:

All test specifications are valid only for Bosch Fuel-injection Pump Test Benches and Testers 0,14

Test Instructions and Test Equipment

Pre-stroke setting

0,02 (0,04)

see VDT-W-460/. .

| 1. Settings  | Rot. speed rev/min | Settings              |   | Charge-air press.<br>bar (kgf/cm²) | Difference in delivery cm <sup>3</sup> |
|--|--------------------|-----------------------|---|------------------------------------|--|
| 1 1 Timing device travel 1 2 Supply-pump pressure  | 1400<br>1400       | 2,4-2,8<br>5,0-5,6    | mm<br>bar (kgf/cm²)   |                                    |  |
| 1.3 Full-load delivery with charge-air pressure Full-load delivery without charge-air pressure 1.4 Idle regulation | 1400<br>375        | 35,0-36,0<br>6,0-10,0 | cm <sup>3</sup> /1000 strokes<br>cm <sup>3</sup> /1000 strokes<br>cm <sup>3</sup> /1000 strokes |                                    | 2,5 (3,0)<br>2,0 (3,0)                 |
| 1 5 Full-speed regulation<br>1 6 Start   | 2650<br>100        | 6,0-12,0<br>min. 50,0 | cm <sup>3</sup> /1000 strokes<br>cm <sup>3</sup> /1000 strokes                                  |                                    |  |
| 1.7 Load-dependent port-closing  | -                  |                       |   |                                    |  |

| 2. Test Spe       | cifications                          | checking values in brackets ( | )         | 2400                    |
|-------------------|--------------------------------------|-------------------------------|-----------|-------------------------|
| 2 1 Timing device | ww<br>u = 16A\win                    | 1,3-2,1(1,0-2,4)              | (1,9-3,3) | 5,1-5,9 (4,8-6,2)       |
| 2 2 Supply pump   | n = rev/min<br>bar (kgf/cm²)         | 500<br>2,8-3,4                |           | 2400<br>7,5-8,1         |
| Overflow delivery | n = rev/min<br>cm <sup>3</sup> /10 s | 500<br>55-138 (40-153)        |           | 2400<br>55-138 (40-153) |

| 2 3 Fuel deliveries            |                                     |   |                                   |
|--------------------------------|-------------------------------------|---|-----------------------------------|
| Speed control lever            | Rot speed rev/min                   | Fuel delivery cm³/1000 strokes  | Charge-air press<br>bar (kgf/cm²) |
| End stop                       | 2800<br>2650<br>2400<br>1400<br>750 | max. 3,0<br>(5,0-13,<br>29,5-31,5(28,3-32,<br>(33,3-37,<br>25,0-28,0(24,2-28, | 7)<br>7)                          |
| switch-off<br>mech.<br>elektr. | 2400<br>400                         | 0   |                                   |
| idie stop                      | 375<br>450                          | max. 3,0  | 12,0)                             |
| End stop                       | 400<br>500                          | min. 16,5<br>max. 23,5  |                                   |
| 2.4 Solenoid                   | max. cut-in volt                    | 4 4 14 4014   | L                                 |

| 3. Dimen     | SIONS<br>for assembly<br>and adjustment<br>mm |
|--------------|---|
| к            | 5,7-6,0                                       |
| KF           | 1,7-1,9                                       |
| MS           |   |
| svs          | 2,8   |
| A<br>B       |   |
| Observations |   |
|              |   |
|              |   |
|              |   |
|              |   |
|              |   |

J10

WPP 001/4 VWW 2,0 i

2. Edition

Stolkino 4113

VE 5/10 F 2400 L 137-1 Overflow temperature 45° C

ipersedes 7.83

company VWW

0 460 405 032

All test specifications are valid only for Bosch Fuel-Injection Pump Test Benches and Testers

Test Instructions and Test Equipment

Pre-stroke setting

0,14

± 0,02 (0,04)

see VDT-W-460/...

| 1. Settings  | Rot. speed rev/min | Settings           |                                   | Charge-air press.<br>bar (kgf/cm²) | Difference in delivery cm <sup>3</sup> |
|--|--------------------|--------------------|-----------------------------------|------------------------------------|--|
| 1 1 Timing device travel   | 1400               | 2,4-2,8<br>5,0-5,6 | mm                                |                                    |  |
| 1 2 Supply-pump pressure   | 1400               | 3,0-3,0            | bar (kgf/cm²)<br>cm³/1000 strokes |                                    |  |
| 1 3 Full-load delivery with<br>charge-air pressure<br>Full-load delivery without | 1400               | 35,0-36,0          | cm <sup>3</sup> /1000 strokes     |                                    | 2,5 (3,0                               |
| charge-air pressure  | 375                | 6,0-10,0           | cm³/1000 strokes                  |                                    | 2,0 (3,0                               |
| 1 5 Full-speed regulation  | 2650               | 6,0-12,0           | cm <sup>3</sup> /1000 strokes     |                                    |  |
| 1 6 Start  | 100                | min. 50,0          | cm <sup>3</sup> /1000 strokes     |                                    |  |
| 1 7 Load-dependent port-closing  | -                  |                    |                                   |                                    |  |

| 2. lest Spe                              | chications                          | checking values in brackets (  | )<br>             |  |
|--|-------------------------------------|--|-------------------|--|
| 2 1 Timing device                        | n = rev/min<br>mm                   | 1000<br>1,3-2,1 (1,0-2,4)  | 1400<br>(1,9-3,3) | 2400<br>5,1-5,9 (4,8-6                       |
| 2 2 Supply pump                          | n = rev/min<br>bar (kgf/cm²)        | 500<br>2,8-3,4   |                   | 2400<br>7 <b>,5-8,1</b>                      |
| Overflow delivery                        | n = rev/min<br>cm³/10 s             | 500<br>55-138 (40-153)   |                   | 2400<br>55-138 (40-15                        |
| 2 3 Fuel deliveries  Speed control lever | Rot. speed                          | Fuel delivery  | Charge-air press. | 3. Dimensions for assembly and adjustment mm |
| End stop                                 | 2800<br>2650<br>2400<br>1400<br>750 | max. 3,0<br>(5,0-13,0)<br>29,5-31,5 (28,3-32<br>(33,3-37<br>25,0-28,0 (24,2-28 |                   | KF 5,7-6,0 1,7-1,9 2,8                       |
| switch-off<br>mech.<br>elektr.           | 2400                                | 0  |                   | В  |
| Idle stop                                | 375<br>450                          | max. 3,0 (4,0-12,0)  |                   | Observations                                 |
| End stop                                 | 400<br>500                          | min. 16,5<br>max. 23,5   |                   |  |
| 2.4 Solenoid                             | max. cut-in voltag                  | • xxx min. 10,0 V<br>rated voltage 12V.  |                   |  |

WPP 001/4 IHC 3,9 y 3. Edition

VE 4/11 F 1150 R 140 0 460 414 009 DHK 1 688 901 020 Pre-stroke setting

(1) 117 Overflow temperature 45° C

supersedes 4 . 84 company: IHC

DT 239/856

All test specifications are valid only for Bosch Fuel-injection Pump Test Benches and Testers

Test Instructions and Test Equipment

± 0,02 (0,04) 0,2 mm

see VDT-W-460/...

| Rot. speed | Settings                                 | Charge-air press.<br>bar (kgf/cm²)   | Difference in delivery cm <sup>3</sup>  |
|------------|--|--|---|
| 800        | 4,5 - 4,9 <sub>mm</sub>                  | 0,8  |   |
| 800        | 5.3 - 5.9 har (kaf/cm²)                  | 8,0  |   |
| 1          |  | 0,8  | 3,5 (4,0  |
|            |  |  |   |
| 350        |  |  | 3,5 (4,0  |
| 1250       | 42,0 - 48,0 cm <sup>3</sup> /1000 stroke | 9,0  |   |
|            | min. 100 cm <sup>3</sup> /1000 stroke    | 0  |   |
|            |  |  |   |
|            | 800<br>800<br>800<br>500<br>350          | 800 4,5 - 4,9 mm  800 5,3 - 5,9 bar (kgf/cm²)  800 92,2 - 93,2 cm²/1000 stroke  500 75,5 - 77,5 cm²/1000 stroke  350 23,0 - 27,0 cm²/1000 stroke  1250 42,0 - 48,0 cm²/1000 stroke | 800 4,5 - 4,9 mm 0,8 800 5,3 - 5,9 bar (kgf/cm²) 0,8 800 92,2 - 93,2 cm²/1000 strokes 0,8 500 75,5 - 77,5 cm³/1000 strokes 0 350 23,0 - 27,0 cm²/1000 strokes 0 1250 42,0 - 48,0 cm²/1000 strokes 0,8 |

| 2. Test Spec                             | cifications  | checking values in bracke           | ets ( )                  | yn die specifie oek oek oek oek en de beken de beske de beske de beken de beken de beken de beken de beken de b | ه سن کنت لیده سید جده مشد سی مسیحترست پیش در میسی باش مده عهد در |  |
|--|--|-------------------------------------|--------------------------|---|--|--|
| 2 1 Timing device<br>LDA = 0,8 b         | n = rev/min  | 400<br>0,8-1,6 (0,5-                |                          | 800<br>(4,0 - 5,4   | ) 5,3 - 6,   | 1150<br>1 (5,0 - 6,4)                        |
| 22Supply pump<br>LDA = 0,8 b             | n = rev/min<br>a þar (kgf/cm²)                             | 400<br>3.7 - 4,3                    |                          |   |  | 50<br>- 7,0                                  |
| Overflow delivery                        | n = rev/min<br>cm <sup>3</sup> /10 s                       | 500<br>55-138 (40                   | -153)                    |   | 11<br>55-138 (   | 50<br>40-153)                                |
| 2 3 Fuel deliveries  Speed control lever | Rot speed  | Fuel delivery                       |                          | Charge-air press  | 3. Dimens  | ions<br>for assembly<br>and adjustment<br>mm |
| End stop                                 | 1300<br>1270<br>1250<br>1130<br>800<br>800 *<br>500<br>500 | max. 2,5<br>min. 2,5<br>85,4 - 88,4 | (90,0-95,4<br>(85,7-91,1 | 0,8<br>0,8<br>5) 0,8<br>) 0,8<br>) 0,8  | K<br>KF<br>MS<br>SVS   | 5,2 - 5,4<br>1,2 - 1,4<br>5,0                |
| switch-off                               |  |                                     |                          |   | A K  | 20,2 - 22,2<br>12,3 - 15,7                   |
| ldle stop                                | 350<br>400<br>450  | max. 3,0                            | (20,5-29,5<br>(3,5-12,5  | j)  |  | d-pressure<br>ator stroke                    |
| End stop                                 | 220<br>300   | min. 100<br>max. 80                 |                          |   | Correct  | ion at the ng nut. (46)                      |
| 2.4 Solenoid                             | max cut-in volta   |                                     |                          |   |  | 7.04   |

BOSCH

WPP 001/4 VWW 2,4 1

3. Edition

VE 6/10 F 2400 L 144 0 460 406 029

Overflow temperature 45° C

supersed

company087 T

Different test specs with restriction bore 0.86 mm. See Page 2.

All test specifications are valid only for Bosch Fuel-injection Pump Test Benches and Testers

Test Instructions and Test Equipment

Pre-stroke setting mm see VDT-W-460/

| 1. Settings  | Rot.speed<br>rev/min                              | Settings   |   | Charge-air press.<br>bar (kgf/cm²)     | Difference in delivery cm <sup>3</sup> |
|--|---|--|---|--|--|
| 1 1 Timing device travel 1 2 Supply-pump pressure 1 3 Full-load delivery with charge-air pressure Full-load delivery without charge-air pressure 1 4 Idle regulation 1 5 Full-speed regulation 1 6 Start 1 7 Load-dependent port-closing | 1500<br>1500<br>600<br>1500<br>375<br>2600<br>100 | 1,2=1,6<br>5,7-6,3<br>25,5-26,5<br>44,0-45,0<br>6,0-10,0<br>10,0-16,0<br>min. 42 | mm bar (kgf/cm²) cm³/1000 strokes cm³/1000 strokes cm³/1000 strokes cm³/1000 strokes cm³/1000 strokes | 0,75<br>0,75<br>0<br>0,75<br>0<br>0,75 | 2,5 (3,0)<br>2,0 (3,0)                 |

| 2. Test Spec                      | cifications                          | checking values in brackets ( | )                                 | •          |
|-----------------------------------|--------------------------------------|-------------------------------|-----------------------------------|------------|
| 2 1 Timing device<br>LDA=0,75 bar | n = rev/min                          | See Page 2 (with              | nout restriction bore)            |            |
| 22Supplypump<br>LDA=0,75 bar      | n = rev/min<br>bar (kgf/cm²)         | 600<br>3,3-3,9                | 2400<br>7,8 - 8,4                 |            |
| Overflow delivery                 | n = rev/min<br>cm <sup>3</sup> /10 s | 600 (0 bar)<br>55-138(40-153) | 2400 (0,75 bar)<br>55-138(40-153) |            |
|                                   |                                      | L                             | 1 12                              | Dimensions |

| Rot speed rev/min                            | Fuel delivery cm <sup>3</sup> /1000 strokes                              |  | Charge-air press<br>bar (kgf/cm²)  |
|--|--|--|--|
| 2750<br>2600<br>2400<br>1500<br>800**<br>600 | max. 4,0<br>35,0-37,0<br>32,5-33,5                                       | (9,0-17,0)<br>(33,7-38,3)<br>(42,2-46,8)<br>(30,0-36,0)<br>(23,0-29,0)   | 0,75   |
| 400  | 0  |  |  |
| 375<br>450                                   | max. 3,0   | (4,0-12,0)   |  |
| 400<br>500                                   | min. 20<br>max. 30   |  |  |
|  | 2750<br>2600<br>2400<br>1500<br>800**<br>600<br>400<br>375<br>450<br>400 | rev/min cm³/1000 strokes  2750 max. 4,0  2600 2400 35,0-37,0 1500 800** 32,5-33,5  400 0  375 450 max. 3,0 400 min. 20 | rev/min cm3/1000 strokes  2750 max. 4,0 2600 2400 35,0-37,0 (33,7-38,3) 1500 (42,2-46,8) 800** 32,5-33,5 (30,0-36,0) 600 0  375 (4,0-12,0) 400 min. 20 |

| 3. Dimens    | tor assembly         |
|--------------|----------------------|
| Designation  | and adjustment<br>mm |
| к            | 3,2-3,4              |
| KF           | 6,3-6,6              |
| MŞ,          | 1,7-1,9              |
| SVS          | max.6,0              |
| LDA-Hub**    | 5,3                  |
| A XK         | 21,8-23,8            |
| в XL         | 8,9-12,3             |
| Observations | 1                    |
|              |                      |
|              |                      |
|              |                      |
|              |                      |

VWW 2.4 1 1

#### Timing device

| $n = min^{-1}$                       | Solenoid valve                                    | manifold-pressure<br>compensator     | mm  |
|--------------------------------------|---|--------------------------------------|---|
| 1500<br>1500<br>2000<br>2000<br>2400 | 12 Volt<br>0 Volt<br>12 Volt<br>0 Volt<br>12 Volt | 0.75<br>0.75<br>0.75<br>0.75<br>0.75 | 1.2-1.6 (0.7-2.1)<br>3.0-4.0 (2.8-4.2)<br>3.6-4.4 (3.3-4.7)<br>4.9-6.1 (4.8-6.2)<br>5.6-6.4 (5.3-6.7) |
| Supply pump                          | •   | ·                                    |   |
| 1500                                 | 0 Volt  | 0.75                                 | 6.8-7.4 bar   |

#### Differing test specifications for solenoid valve with throttle bore

#### Timing device

| n = min <sup>-1</sup>                            | Solenoid valve                                    | manifold-pressure<br>compensator        | mm  |
|--|---|---|---|
| 1500<br>1500<br>2000<br>2000<br>2400             | 12 Volt<br>0 Volt<br>12 Volt<br>0 Volt<br>12 Volt | 0.75<br>0.75<br>0.75<br>0.75<br>0.75    | 0.8-1.2 (0.3-1.7)<br>3.0-4.0 (2.8-4.2)<br>3.1-3.9 (2.8-4.2)<br>5.8-7.0 (5.7-7.1)<br>5.0-5.8 (4.7-6.1) |
| Supply pump<br>1500                              | 0 Volt  | 0.75                                    | 6.8-7.4 bar   |
| Idle<br>415 min-1<br>750 min-1<br>Full load      | 6.0-10.0 (4.<br>max. 3.0                          | .0-12.0) ccm/1000 str.                  |   |
| 2850 min <sup>-1</sup><br>2675 min <sup>-1</sup> | max. 4.0<br>10.0-16.0(9                           | ccm/1000 str.<br>.0-17.0) ccm/1000 str. |   |

(1)

## Test Specifications Distributor-type Fuel-injection Pumps

46

WPP 001/4 VWW 2,4 1 1

3. Edition

VE 6/10 F 2400 L 144-1

Overflow temperature 45° C

supersedes 12.83 company VWW

0 460 406 030

engine: 087 T

Different test specs with restriction bore 0.86 mm. See Page 2.

All test specifications are valid only for Bosch Fuel-injection Pump Test Benches and Testers

Test Instructions and Test Equipment

Pre-stroke setting

- mm

see VDT-W-460/.

| 1. Settings  | Rot speed rev/min | Settings  |                               | Charge-air press.<br>bar (kgf/cm²) | Difference in delivery cm <sup>3</sup> |
|--|-------------------|-----------|-------------------------------|------------------------------------|--|
|  | 1500              | 1,2-1,6   | IIIM                          | 0,75                               |  |
| 1 1 Timing device travel   | 1500              | 5,7-6,3   | bar (kgf/cm²)                 | 0,75                               |  |
| 1 2 Supply-pump pressure   | 600               | 25,5-26,5 | cm³/1000 strokes              | 0                                  |  |
| 1.3 Full-load delivery with<br>charge-air pressure<br>Full-load delivery without | 1500              | 44,0-45,0 | cm³/1000 strokes              | 0,75                               | 2,5 (3,0)                              |
| charge air pressure  | 375               | 6,0-10,0  | cm <sup>3</sup> /1000 strokes | 0                                  | 2,0 (3,0)                              |
| 1.5 Full-speed regulation  | 2600              | 10,0-16,0 | cm <sup>3</sup> /1000 strokes | 0,75                               |  |
| 1 6 Start  | 100               | min. 42   | cm <sup>3</sup> /1000 strokes | 0                                  |  |
| 1.7 Load-dependent port-closing  | -                 | -         |                               |                                    |  |

| 2. Test Spec                     | cifications           | checking values in brackets ( | )                    |
|----------------------------------|-----------------------|-------------------------------|----------------------|
| 21 Timing device<br>LDA=0,75 bar | n = rev/min<br>mm     | See Page 2 (witho             | ut restriction bore) |
| 2 2 Supply pump                  | n = rev/min           | 600                           | 2400                 |
| LDA=0,75 bar                     | bar (kgf/cm²)         | 3,3-3,9                       | 8,1-8,7              |
| Overflow delivery                | n = rev/min           | 600 (0 bar)                   | 2400 (0,75 bar)      |
|                                  | cm <sup>3</sup> /10 s | 55-138(40-153)                | 55-138(40-153)       |

| Speed control lever | Rot.speed        | Fuel delivery                 |                            | Charge-air press |
|---------------------|------------------|-------------------------------|----------------------------|------------------|
|                     | rev/min          | cm <sup>3</sup> /1000 strokes |                            | bar (kgf/cm²)    |
| End stop            | 2750             | max. 4,0                      |                            | 0,75             |
|                     | 2600             |                               | (9,0-17,0)                 | 0,75             |
|                     | 2400             | 35,0-37,0                     | (33,7-38,3)                | 0,75             |
|                     | 1500             | 20 5 22 5                     | (42,2-46,8)                | 0,75             |
|                     | 800**            | 32,5-33,5                     | (30,0-36,0)<br>(23,0-29,0) | 0,3              |
|                     | 600              |                               | (23,0-23,0)                |                  |
|                     |                  |                               |                            |                  |
| switch-off          |                  |                               |                            |                  |
| mech.               | 2400             | 0                             |                            | 1                |
| elektr.             | 400              | 0                             |                            | ļ                |
| idle stop           | 375              |                               | (4,0-12,0)                 |                  |
|                     | 450              | max. 3,0                      | (1,0 12,0)                 |                  |
| Fad akan            | 400              | min. 20                       |                            |                  |
| End stop            | 500              | max. 30                       |                            |                  |
|                     | 300              | iliax. 30                     |                            |                  |
| 24 Solenoid         | max cut-in voice | we xxx min.                   | 10 V                       | <u> </u>         |
|                     | tostypupos       | rated volta                   |                            |                  |

| ions<br>for assembly<br>and adjustment |
|--|
| mm                                     |
| 3,2-3,4                                |
| 6,3-6,6                                |
| 1,7-1,9                                |
| max.6,0                                |
| 5,3                                    |
| 21,8-23,8                              |
| 8,9-12,3                               |
| <del>1</del>                           |
|  |
|  |
|  |
|  |
|  |

BOSCH

VWW 2.4 1 1

#### Timing device

| n = min <sup>-1</sup>                | Solenoid valve                                    | manifold-pressure<br>compensator     | mm  |
|--------------------------------------|---|--------------------------------------|---|
| 1500<br>1500<br>2000<br>2000<br>2400 | 12 Volt<br>0 Volt<br>12 Volt<br>0 Volt<br>12 Volt | 0.75<br>0.75<br>0.75<br>0.75<br>0.75 | 1.2-1.6 (0.7-2.1)<br>3.0-4.0 (2.8-4.2)<br>3.6-4.4 (3.3-4.7)<br>4.9-6.1 (4.8-6.2)<br>5.6-6.4 (5.3-6.7) |
| Supply pump                          |   |                                      |   |
| 1500                                 | 0 Volt  | 0.75                                 | 6.8-7.4 bar   |

Differing test specifications for solenoid valve with throttle bore

#### Timing device

| n = min <sup>-1</sup>                     | Solenoid valve                                    | manifold-pressure<br>compensator         | mm  |
|---|---|--|---|
| 1500<br>1500<br>2000<br>2000<br>2400      | 12 Volt<br>0 Volt<br>12 Volt<br>0 Volt<br>12 Volt | 0.75<br>0.75<br>0.75<br>0.75<br>0.75     | 0.8-1.2 (0.3-1.7)<br>3.0-4.0 (2.8-4.2)<br>3.1-3.9 (2.8-4.2)<br>5.8-7.0 (5.7-7.1)<br>5.0-5.8 (4.7-6.1) |
| Supply pump<br>1500                       | 0 Volt  | 0.75                                     | 6.8-7.4 bar   |
| 1dle<br>415 min-1<br>750 min<br>Full load | 6.0-10.0 (4<br>max. 3.0                           | .0-12.0) ccm/1000 str.                   |   |
| 2850 min-1<br>2675 min                    | max. 4.0<br>10.0-16.0(9                           | ccm/1000 str.<br>0.0-17.0) ccm/1000 str. |   |

WPP 001/4 VWW 2,4 1 3

2. Edition

VE 6/10 F 2400 L 146

Overflow temperature 45° C

VWW 087 engine:

0 460 406 033

All test specifications are valid only for Bosch Fuel-injection Pump Test Benches and Testers

Test Instructions and Test Equipment

Pre-stroke setting

see VDT-W-460/

| 1. Settings  | Rot. speed rev/min | Settings  |                               | Charge-air press.<br>bar (kgf/cm²) | Difference in delivery cm <sup>3</sup> |
|--|--------------------|-----------|-------------------------------|------------------------------------|--|
| the second secon | 1500               | 2,8-3,2   | mm                            |                                    |  |
| 1 1 Timing device travel   | 1500               | 5,2-5,8   | bar (kgf/cm²)                 |                                    |  |
| 1 2 Supply-pump pressure   | 1500               | 28,5-29,5 | cm <sup>3</sup> /1000 strokes |                                    | 2,5 (3,0)                              |
| 1 3 Full-load delivery with charge-air pressure  | -                  | -         | cm <sup>3</sup> /1000 strokes |                                    | İ                                      |
| Full-load delivery without charge-air pressure  1 4 Idle regulation  | 375                | 6,0-10,0  | cm <sup>3</sup> /1000 strokes |                                    | 2,0 (3,0)                              |
| 1.5 Full-speed regulation  | 100                | min. 35   | cm <sup>3</sup> /1000 strokes |                                    |  |
| 1 6 Start  | 2700               | 6,0-12,0  | cm <sup>3</sup> /1000 strokes |                                    |  |
| 1.7 Load-dependent port-closing  | -                  | ·         |                               |                                    |  |

| 2. Test Spe       | cifications                  | checking values in brackets | :(  | )               |                      |
|-------------------|------------------------------|-----------------------------|-----|-----------------|----------------------|
| 2 1 Timing device | n = rev/min                  | 750                         | 750 | 1500            | 1500 2400            |
|                   | mm                           | 0,2-1,0(0-1,3)              | (*) | (2,3-3,7)       | (*) 5,7-6,5(5,4-6,8) |
| 2 2 Supply pump   | n = rev/min<br>bar (kgf/cm²) | 600<br>2,8-3,4              |     | 1500<br>(*)     | 2400<br>7,7-8,3      |
| Overflow delivery | n = rev/min                  | 600                         |     | 2400            |                      |
|                   | cm <sup>3</sup> /10 s        | 55-138 (40-153)             |     | 55-138 (40-153) |                      |

|                       | 1                 |   |                                   |
|-----------------------|-------------------|---|-----------------------------------|
| 2 3 Fuel deliveries   |                   |   |                                   |
| Speed control lever   | Rot speed rev/min | Fuel delivery cm <sup>3</sup> /1000 strokes | Charge-air press<br>bar (kg//cm²) |
| End stop              | 2825<br>2700      | max. 3,0 (5,0-1                             | 13.0)                             |
|                       | 2400              | 22,0-24,0 (20,7-                            | 1                                 |
|                       | 1500              | (26,7-                                      | -31.3)                            |
|                       | 750               | 26,0-29,0 (24,5                             |                                   |
| switch-off<br>elektr. | 400               | 0   |                                   |
| elekti.               | 400               |   |                                   |
| idle stop             | 375               | (4,0  | -12,0)                            |
|                       | 600               | max. 4,0                                    |                                   |
| End ston              | 400               | min. 20                                     |                                   |
| End stop              | 500               | max. 25                                     |                                   |
| 2.4 Solenoid          | max cut in vol    | lege xxx min. 10 V<br>xx rated voltage 12V  |                                   |

| 3. Dimen     | for assembly         |
|--------------|----------------------|
| Designation  | and adjustment<br>mm |
| К            | 3,2-3,4              |
| KF           | 6,4-6,7              |
| MS           | 1,5-1,7              |
| svs          | 3,6                  |
|              |                      |
| A XK         | 21,8-23,8            |
| B XL         | 8,9-12,3             |
| Observations |                      |

Please note instructions on sheet 2

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#### Timing device

| n = min <sup>-1</sup> | Solenoid valve   | mm                                     |
|-----------------------|------------------|--|
| 750<br>1500           | 0 Volt<br>0 Volt | 1.2-2.4 (1.1-2.5)<br>3.7-4.7 (3.5-4.9) |
| Supply pump           |                  |  |
| 1500                  | 0 Volt           | 6.3-6.9 bar                            |

#### As of FD 445

#### Timing device

| n = min <sup>-1</sup> | Solenoid valve    | mm                                     |
|-----------------------|-------------------|--|
| 1000                  | 12 Volt           | 0.6-1.4 (0.3-1.7)                      |
| 1000<br>1500          | 0 Volt<br>12 Volt | 1.8-3.0 (1.7-3.1)<br>2.8-3.2 (2.3-3.7) |
| 1500                  | 0 Volt            | 4.1-5.1 (3.9-5.3)                      |
| 2400                  | 12 Volt           | 6.0-6.8 (5.7-7.1)                      |
| Supply pump           |                   |  |
| 1500                  | 0 Volt            | 6.6-7.2 bar                            |
|                       |                   |  |

<sup>\*</sup> Do not apply any voltage to the solenoid valve at the points so marked.

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WPP 001/4 VWW 2,4 1 2 2. Edition

VE 6/10 F 2400 L 146-1

Overflow temperature 45° C

supersedes 10.83 company. VWW engine: 087

0 460 406 034

All test specifications are valid only for Bosch Fuel-injection Pump Test Benches and Testers

Test Instructions and Test Equipment

see VDT-W-460/...

Pre-stroke setting mm

| 1. Settings  | Rot. speed rev/min | Settings  |  | Charge-air press<br>bar (kgf/cm²) | Difference in delivery cm <sup>3</sup> |
|--|--------------------|-----------|--|-----------------------------------|--|
| 1 1 Timing device travel   | 1500               | 2,8-3,2   | mm   |                                   |  |
| 1 2 Supply-pump pressure   | 1500               | 5,2-5,8   | bar (kgf/cm²)  |                                   |  |
| 1 3 Full-load delivery with charge air pressure Full-load delivery without | 1500               | 28,5-29,5 | cm <sup>3</sup> /1000 strokes<br>cm <sup>3</sup> /1000 strokes |                                   | 2,5 (3,0)                              |
| charge-air pressure 1 4 Idle regulation                                    | 375                | 6,0-10,0  | cm <sup>3</sup> /1000 strokes                                  |                                   | 2,0 (3,0)                              |
| 1.5 Full-speed regulation  | 100                | min. 35   | cm <sup>3</sup> /1000 strokes                                  |                                   |  |
| 1 6 Start  | 2700               | 6,0-12,0  | cm <sup>3</sup> /1000 strokes                                  |                                   |  |
| 1.7 Load-dependent port-closing  | -                  |           |  |                                   |  |

| 2. Test Spe       | ecifications                         | checking values in brackets | s( )                   |                        | a paragraphy and the state of t |
|-------------------|--------------------------------------|-----------------------------|------------------------|------------------------|--|
| 2 1 Timing device | n = rev/min<br>mm                    | 750<br>G,2-1,0(0-1,3)       | 750 1500<br>(*) (2,3-3 |                        | 2400<br>5,7-6,5 (5,4-6,8)  |
| 2 2 Supply pump   | n = rev/min<br>bar (kgf/cm²)         | 600<br>2,8-3,4              | 1500<br>(*)            | 2400<br>7,7-8,3        |  |
| Overflow delivery | n = rev/min<br>cm <sup>3</sup> /10 s | 600<br>55-138 (40-153       | 3)                     | 2400<br>55-138 (40-153 | 3)   |
| -                 | . 1                                  | .1                          |                        | 3.0                    | imensions  |

|                                | 1                                   | 33-130 (40-130)   |                                   |
|--------------------------------|-------------------------------------|---|-----------------------------------|
| 2 3 Fuel deliveries            |                                     |   |                                   |
| Speed control lever            | Rot speed rev/min                   | Fuel delivery cm <sup>3</sup> /1000 strokes   | Charge air press<br>bar (kgf/cm²) |
| End stop                       | 2825<br>2700<br>2400<br>1500<br>750 | max. 3,0<br>(5,0-13,0)<br>22,0-24,0 (20,7-25,3)<br>(26,7-31,3)<br>26,0-29,0 (24,5-30,5) |                                   |
| switch-off<br>mech.<br>elektr. | 2400<br>400                         | 0   |                                   |
| idle stop                      | 375<br>600<br>400<br>500            | (4,0-12,0<br>max. 4,0<br>min. 20<br>max. 25   |                                   |
| 2 4 Solenoid                   | max. cut-in volta                   | age xxx min. 10 V<br>c rated voltage 12V.   |                                   |

| 3. Dimen               | Sions<br>for assembly<br>and adjustment<br>mm |
|------------------------|---|
| K<br>KF<br>MS<br>SVS   | 3,2-3,4<br>6,4-6,7<br>1,5-1,7<br>3,6          |
| A XK B XL Observations | 21,8-23,8<br>8,9-12,3                         |

Please note instructions on sheet 2

#### Timing device

| $n = min^{-1}$ | Solenoid valve | mm                                     |   |
|----------------|----------------|--|---|
| 750            | 0 Volt         | 1.2-2.4 (1.1-2.5)<br>3.7-4.7 (3.5-4.9) |   |
| 1500           | 0 Volt         | 3.7-4.7 (3.5-4.9)                      |   |
| Supply pump    |                |  | • |
| 1500           | 0 Volt         | 6.3-6.9 bar                            |   |

As of FD 445

#### Timing device

| n = min <sup>-1</sup> | Solenoid valve | mm                 |
|-----------------------|----------------|--------------------|
| 1000                  | 12 Volt        | 10.6-1.4 (0.3-1.7) |
| 1000                  | 0 Volt         | 1.8-3.0 (1.7-3.1)  |
| 1500                  | 12 Volt        | 2.8-3.2 (2.3-3.7)  |
| 1500                  | 0 Volt         | 4.1-5.1 (3.9-5.3)  |
| 2400                  | 12 Volt        | 6.0-6.8 (5.7-7.1)  |
| Supply pump           |                |                    |
| 1500                  | 0 Volt         | 6.6-7.2 bar        |

<sup>\*</sup> Do not apply any voltage to the solenoid valve at the points so marked.

2. Test Specifications checking values in brackets (

WPP 001/4 VWW 1,6 W 3

engine

3. Edition

VE 4/9 F 2250 R 149

Overflow temperature 45° C

3.84 supersedes company.

VWW 086 T

0 460 494 138

All test specifications are valid only for Bosch Fuel injection Pump Test Benches and Testers

Test Instructions and Test Equipment

see VDT-W-460/

|                   | - |    |
|-------------------|---|----|
| re-stroke setting |   | mm |

| 1. Settings  | Rot speed rev/min | Settings  |                               | Charge-air press<br>bar (kgf/cm²) | Difference in delivery cm <sup>3</sup> |
|--|-------------------|-----------|-------------------------------|-----------------------------------|--|
| A 4 Towns downs trough                               | 1500              | 3,8-4,2   | mm                            | 0,75                              |  |
| 1 1 Timing device travel                             | 1500              | 4,6-5,2   | bar (kgf/cm²)                 | 0,75                              |  |
| 1.2 Supply-pump pressure 1.3 Full-load delivery with | 600               | 23,5-24,5 | cm <sup>3</sup> /1000 strokes | 0                                 |  |
| charge air pressure Full-load delivery without       | 1500              | 43,5-44,5 | cm³/1000 strokes              | 0,75                              | 2,5 (3,0)                              |
| charge air pressure  1.4 title regulation            | 475               | 6,0-10,0  | cm <sup>3</sup> /1000 strokes | 0                                 | 2,0 (3,0)                              |
| 1.5 Full-speed regulation                            | 2525              | 9,0-15,0  | cm <sup>3</sup> /1000 strokes | 0,75                              |  |
| 1 6 Start  | 100               | min. 35,0 | cm <sup>3</sup> /1000 strokes | 0                                 |  |
| 1.7 Load-dependent port-closing                      | -                 |           |                               |                                   |  |

| 2 1 Timing device                       | n = rev/min                                   | 1000<br>1,8-2,6 (1,5-2,9)                            |  | 1500<br>(3,3-4,7)                   | 2250<br>6,1-6,9 (5,8-7,2)                 |  |
|---|---|--|--|-------------------------------------|---|--|
| DA=0,75 bar<br>22Supply pump            | n = rev/min<br>bar (kgf/cm²)                  | 600<br>2,5-3,1                                       | and the second s |                                     | 2250<br>6,5-7,1                           | 4 Managadagan anagada 41 a gamanagan anagaman anagaman anagaman anagaman anagaman anagaman anagaman anagaman a |
| .DA=0,75 bar<br>Overllow delivery       | n = rev/min<br>cm <sup>3</sup> /10 s          | 600<br>55-138 (40-                                   | 153)   | 55                                  | 2250 (0,<br>-138 (40-15                   |  |
| 2 3 Fuel deliveries Speed control lever | Rot speed                                     | Fuel delivery<br>cm <sup>3</sup> /1000 strokes       |  | Charge-air press<br>bar (kgf/cm²)   | 3. Dimen                                  | SionS<br>tor assembly<br>and adjustment<br>mm  |
| End stop                                | 2750<br>2525<br>2250<br>1500<br>1000 *<br>600 | max. 3,0<br>(8<br>38,0-39,C<br>(4<br>33,5-34,5<br>(3 | ,0-16,0)<br>6,7-41,3)<br>1,8-46,2)<br>1,8-36,2)<br>1,0-27,0)   | 0,75<br>0,75<br>0,75<br>0,75<br>0,3 | K<br>KF<br>MS<br>SVS<br>** FH<br>XK<br>XL | 3,2-3,4<br>5,7-6,0<br>1,2-1,4<br>4,4<br>1,8-2,4<br>18,4-20,4<br>8,6-12,0                                       |
| switch-off<br>elektr.                   | 400   | 0  |  |                                     | A<br>8                                    |  |
| Idle stop                               | 475<br>1200<br>400<br>500                     | max. 5,0<br>min. 22,0<br>max. 30,0                   | ,0-12,0)   |                                     | compensa<br>= 4,0 m                       | l-pressure<br>tor stroke<br>m<br>on at the   |

2.4 Solenoid

አጀአሪያኒያያያያያ ያያያያያያያያ ያያያያያያያያያ Tated voltage 12V.

adjusting nuts (46)

\*operating

stroke (KSB)

WPP 001/4 CUM 5,9 i

1. Edition

VE 6/12 F 1250 R 159-1

0 460 426 041

Pre-stroke setting

DHK: 1 688 901 016/207 +3bar

Overflow temperature 45° C

All test specifications are valid only for Bosch Fuel-Injection Pump Tast Benches and Testers

company. 6 BT-590

114 kW bei 2500 1/min

Test Instructions and Test Equipment

see VDT-W-460/

| I. Settings  | Rot speed rev/min | Settings  |                               | Charge-air press<br>bar (kgf/cm²) | Difference in delivery cm <sup>3</sup> |
|--|-------------------|-----------|-------------------------------|-----------------------------------|--|
| A service of the serv | 750               | 3,1-3,5   | mm                            |                                   |  |
| 1 1 Timing device travel   | 750               | 3,6-4,2   | bar (kgf/cm²)                 |                                   |  |
| 1 2 Supply pump pressure   | -                 |           | cm³/1000 strokes              |                                   |  |
| 1.3 Full-load delivery with<br>charge-air pressure   | 1100              | 80,0-81,0 | cm³/1000 strokes              |                                   | 4,0 (4,5)                              |
| Full-load delivery without<br>charge-air pressure  | 375               | 22,0-28,0 | cm³/1000 strokes              |                                   | 3,0 (4,5)                              |
| 1 4 Idle regulation  | 1300              | 54,5-62,5 | cm <sup>3</sup> /1000 strokes |                                   |  |
| 1 5 Full-speed regulation  | 100               | min. 97,0 |                               |                                   |  |
| 1 6 Start  |                   |           | cm <sup>3</sup> /1000 strokes |                                   |  |
| 1.7 Load-dependent port-closing  | _                 |           |                               |                                   |  |

| n = rev/min<br>mm                          | 1,1-1,9 (0,8-2,2)   | (2,6-4,0)   | -4,0) 5,0-5,8 (4,7-6,1)                         |   |
|--|---|---|---|---|
| n = rev/min<br>bar (kgf/cm²)               | 2,5-3,1   |   | 5,1-5,7   |   |
| n = rev/min<br>cm <sup>3</sup> /10 s       | 55-138 (40-153) 5   |   | 1250<br>55-138 (40-153)                         |   |
| Rot speed                                  | Fuel delivery   | Charge-air press  | 3. Dimer  | tor assembly<br>and adjustment<br>mm  |
| 1390<br>1300<br>1250<br>1100<br>750<br>500 | max. 1,5<br>(53,5-63,5)<br>75,0-78,0 (73,5-79,5)<br>(77,5-83,5)<br>84,5-88,5 (82,8-90,2)                            |   | K<br>KF<br>MS<br>SVS                            | 5,1-5,3<br>1,4-1,6<br>1,2   |
| 375  |   |   | AXK<br>BXL                                      | 20,2-22,2   |
| 300<br>375<br>450                          |   |   | Observations  Pulling electromagnet 24 V        |   |
|  | mm  n = rev/min bar (kgf/cm²)  n = rev/min cm³/10 s  Rot speed rev/min 1390 1300 1250 1100 750 500  375 300 375 450 | The speed   The | 1,1-1,9 (0,8-2,2) (2,6-4,0)  500 2,5-3,1  500 1 | Total speed rev/min   Total speed rev/min |

WPP 001/4 CDC 5,9 a 1. Edition

VE 6/12 F 1100 R 159-2

Overflow temperature 45° C

supersettes

0 460 426 042

CDC company.

6 BT 590-106 kW engine

DHK 1688 901 016/207 + 3 bar

All test specifications are valid only for Bosch Fuel-injection Pump Test Benches and Testers

Test Instructions and Test Equipment

Pre-stroke setting

0,3

±0,92 (0,04)

see VDT-W-460/

| 1. Settings  | Rot speed rev/min                            | Settings   |  | Charge-air press<br>bar (kgf/cm²) | Difference in delivery cm <sup>3</sup> |
|--|--|--|--|-----------------------------------|--|
| 1 1 Timing device travel 1 2 Supply pump pressure 1 3 Full-foad delivery with charge air pressure Full-foad delivery without charge air pressure 1 4 Idle regulation 1 5 Full speed regulation 1 6 Start | 750<br>750<br>-<br>900<br>375<br>1220<br>100 | 3,1-3,5<br>3,6-4,2<br>82,0-83,0<br>22,0-28,0<br>34,0-40,0<br>min. 97 | mm bar (kgf/cm²) cm³/1000 strokes cm³/1000 strokes cm³/1000 strokes cm³/1000 strokes |                                   | 4,0 (4,5)<br>3,5 (4,5)                 |
| 1.7 Load dependent port-closing  |  |  |  | 1                                 |  |

| 2. Test Spe         | cification:                          | S checking values in brackets ( |  |
|---------------------|--------------------------------------|---------------------------------|--|
| 2 1 Timing device   | n = rev/min                          | 500<br>1,2-2,0(0,9-2,3)         | 750 1100<br>(2,6-4,0) 5,1-5,9 (4,8-6,2)                  |
| 2 2 Supply pump     | n = rev/min<br>bar (kgf/cm²)         | 500<br>2,6-3,2                  | 1100<br>5,0-5,6  |
| Overflow delivery   | n = rev/min<br>cm <sup>3</sup> /10 s | 500<br>55-138 (40-153)          | 1100<br>55-138 (40-153)                                  |
| 2 3 Fuel deliveries | Rot speed                            | Fuel delivery                   | 3. Dimensions for assembly and adjustment Designation mm |

| 2 3 Fuel deliveries |   |  |                                   | 3. Dime              |
|---------------------|---|--|-----------------------------------|----------------------|
| Speed control lever |   | Fuel delivery<br>cm <sup>3</sup> /1000 strokes   | Charge-air press<br>bar (kgf/cm²) | Designation          |
| End stop            | 1280<br>1250<br>1220<br>1100<br>900<br>750<br>500 | max. 1,5<br>6,0-14,0 (5,0-15,0)<br>(32,0-42,0)<br>75,0-78,0 (73,5-79,5)<br>(79,5-85,5)<br>81,0-85,0 (80,0-86,0)<br>79,0-83,0 (77,3-84,7) |                                   | K<br>KF<br>MS<br>SVS |
| switch-off          |   |  |                                   | A XK                 |
| Idle stop           | 300<br>375<br>450<br>130<br>200                   | 47,0-55,0(46,0-56,0)<br>(20,0-30,0)<br>max. 1,5<br>min. 97<br>max. 85  | o                                 | Observations         |
| 2 4 Solenoid        | max cut-in voltage                                | xxx min. 10 V rated voltage 12V.   |                                   |                      |

5,1-5,4 1,4-1,6

20,2-22,2 10,7-14,1

1,2

(1)

VE 6/12 F 1100 R 159-8 Overflow temperature 45° C

0 460 426 050

DHK: 1 688 901 016/207+3 bar

supersede Cummins company 6 BT - 590

All test specifications are valid only for Bosch Fuel-injection Pump Test Benches and Testers

Test Instructions and Test Equipment

Pre stroke setting

0,3

±0,02 (0,04)

see VDT-W-460/

| 1. Settings  | Rot speed rev/min | Settings           |  | Charge-air press<br>bar (kgf/cm²) | Difference in delivery cm <sup>3</sup> |
|--|-------------------|--------------------|--|-----------------------------------|--|
| 1 1 Timing device travel 1 2 Supply pump pressure                                | 750<br>750        | 3,1-3,5<br>3,7-4,3 | mm<br>bar (kgt/cm²)  |                                   |  |
| 1 3 Full-load delivery with<br>charge air pressure<br>Full load delivery without | 900               | 73,0-74,0          | cm <sup>3</sup> /1000 strokes<br>cm <sup>3</sup> /1000 strokes |                                   | 4,0 (4,5)                              |
| charge-air pressure 1 4 Idle regulation  | 375               | 18,5-24,5          | cm <sup>3</sup> /1000 strokes                                  |                                   | 3,5 (4,5)                              |
| 1.5 Full speed regulation  | 1175              | 28,0-34,0          | cm³/1000 strokes   |                                   |  |
| 1 6 Start  | 100               | min.97,0           | cm <sup>3</sup> /1000 strokes                                  |                                   |  |
| 1.7 Load dependent port closing  |                   |                    |  |                                   | <u></u>                                |

| 2. Test Spe        | ecifications                  | checking values in brackets ( | •                |                           |
|--------------------|-------------------------------|-------------------------------|------------------|---------------------------|
| 2 1 Timing device  | n - rev/min                   | 400<br>0,3-1,1 (0-1,4)        | 750<br>(2,6-4,0) | 1100<br>5,4-6,2 (5,1-6,5) |
| 2 2 Supply pump    | n = rev/min<br>bar (kgf/crn²) | 400<br>2,2-2,8                |                  | 1100<br>5,2-5,8           |
| Overflow delivery  | n = rev/min<br>cm³/10 s       | 400<br>55-138 (40-153)        |                  | 1100<br>55-138 (40-153)   |
| 2 3 Fuel delivenes |                               |                               |                  | 3. Dimensions             |

|                     | cm <sup>3</sup> /10 s                     | 55-138 (40-153)  |                                   | 35-138 (40-133)      |  |  |
|---------------------|---|--|-----------------------------------|----------------------|--|--|
| 2 3 Fuel deliveries |   |  |                                   |                      | 3. Dimensions  lor assembly and adjustment |  |
| Speed control lever | Rot. speed rev/min                        | Fuel delivery<br>cm <sup>3</sup> /1000 strokes   | Charge-air press<br>bar (kgf/cm²) | Designation          | mm   |  |
| End stop            | 1250<br>1175<br>1100<br>900<br>750<br>400 | max. 1,5<br>(26,0-36,0)<br>66,0-69,0(64,5-70,5)<br>(70,5-76,5)<br>74,5-78,5(72,8-80,2)<br>88,0-92,0(86,3-93,7) |                                   | K<br>KF<br>MS<br>SVS | 5,1-5,3<br>1,4-1,6<br>1,2                  |  |
| ELAB                | 375                                       | 0  |                                   | 8                    | Ì  |  |
| Idle stop           | 300<br>375<br>450<br>130<br>200           | 47,0-55,0 (46,0-56,0)<br>(16,5-26,5)<br>max. 1,5<br>min. 97<br>max. 90   |                                   | Observations         | _ *  |  |
| 2 4 Solenoid        | max cut-in voltage xxx min. 10 V          |  |                                   |                      |  |  |

WPP 001/4 CUM 5,9 K 1. Edition

VE 6/12 F 1000 R 159-10 0 460 426 052

Overflow temperature 45° C

Nozzle-and-holder assembly 1 683 901 016/207 ± 3 bar

company: Cummins

6 BT 5.9

2000 1/min 65 kW

All test specifications are valid only for Bosch Fuel-injection Pump Test Benches and Testers

Test Instructions and Test Equipment

Pre-stroke setting

0.3

± 0,02 (0,04)

see VDT-W-460/...

estoil-ISO 4113

| 1. Settings                                    | Rot. speed rev/min | Settings  |                               | Charge-air press.<br>bar (kgf/cm²) | Difference in delivery cm <sup>3</sup> |
|--|--------------------|-----------|-------------------------------|------------------------------------|--|
| 1.1 Timing device travel                       | 750                | 4,0-4,4   | mm                            |                                    |  |
| 1.2 Supply-pump pressure                       | 750                | 4,1-4,7   | bar (kgf/cm²)                 |                                    |  |
| 1.3 Full-load delivery with                    | -                  |           | cm³/1000 strokes              |                                    |  |
| charge-air pressure Full-load delivery without | 900                | 53,0-54,0 | cm <sup>3</sup> /1000 strokes |                                    | 4,0(4,5)                               |
| charge-air pressure 1.4 Idle regulation        | 375                | 27,0-33,0 | cm³/1000 strokes              |                                    | 3,5(4,5)                               |
| 1.5 Full-speed regulation                      | 1050               | 28,0-34,0 | cm <sup>3</sup> /1000 strokes |                                    |  |
| 1 6 Start                                      | 100                | min. 97,0 | cm <sup>3</sup> /1000 strokes |                                    |  |
| 1.7 Load-dependent port-closing                |                    |           |                               |                                    |  |

| 2.1 Timing device   | n = rev/min   | 1 4 2 2 | 400            | 750              | 1000<br>6,0-6,8 (5,7-7,1) |
|---------------------|---------------|---------|----------------|------------------|---------------------------|
|                     | mm            | !,4-2,2 | (1,1-2,5)      | (3,5-4,9)        | 0,9-0,0 (5,7-7,1)         |
| 2.2 Supply pump n   | n = rev/min   |         | 400            |                  | 1000                      |
|                     | bar (kgf/cm²) | 2,5     | -3,1           |                  | 5,2-5,8                   |
| Overflow delivery   | n = rev/min   |         | 490            |                  | 1000                      |
|                     |               |         | 5-138 (40-153) |                  |                           |
| 2.3 Fuel deliveries |               | 1       |                |                  | 3. Dimensions             |
| 2.3 Fuel deliveries |               |         |                | L Change on pro- | for as and a              |

|   | cm <sup>3</sup> /10 s                     | 55-138 (40-153)   | 55                                 | 138 (40-15                        | 3)                                |
|---|---|---|------------------------------------|-----------------------------------|-----------------------------------|
| 2.3 Fuel deliveries Speed control lever | Rot. speed                                | Fuel delivery<br>cm <sup>3</sup> /1000 strokes  | Charge-air press.<br>bar (kg//cm²) | 3. Dimen                          | Sions Yor assembly and adjustment |
| End stop  switch-off                    | 1100<br>1050<br>1000<br>900<br>750<br>400 | max. 1,5<br>(26,0-36,0)<br>48,5-51,5 (47,0-53,0)<br>(50,5-56,5)<br>53,5-57,5 (51,8-59,2)<br>50,0-54,0 (48,3-55,7) |                                    | K<br>KF<br>MS<br>SVS              | 5,1-5,3<br>1,4-1,6<br>1,2         |
| ELAB Idle stop End stop 2.4 Solenoid    | 375<br>400<br>450<br>130<br>200           | (25,0-35,0)<br>10,5-18,5 (9,5-19,5)<br>max. 1,5<br>min. 97<br>max. 85   |                                    | Observations  24 V Pull electroma |                                   |

Testoil-ISO 4113

WPP001/4 CUM 5,9 h 1. Edition

En

VE 6/12 F 1000 R 159-11 Overflow temperature 45° C

supersedes

0 460 426 053

Cummins company: 6 BT 590

engine:

Nozzle-and-holder assembly 1 688 901 016/207 + 3 bar

2000 1/min 65 kW /

All test specifications are valid only for Bosch Fuel-injection Pump Test Benches and Testers

Test Instructions and Test Equipment

Pre-stroke setting

0,3

 $mm \pm 0.02 (0.04)$ 

see VDT-W-460/...

| 1. Settings                                       | Rot. speed rev/min | Settings  |                               | Charge-air press.<br>bar (kgf/cm²) | Difference in delivery cm <sup>3</sup> |
|---|--------------------|-----------|-------------------------------|------------------------------------|--|
| 1.1 Timing device travel                          | 750                | 4,0-4,4   | mm                            |                                    |  |
| 1 2 Supply-pump pressure                          | 750                | 4,1-4,7   | bar (kgf/cm²)                 |                                    |  |
| 1.3 Full-load delivery with                       | -                  |           | cm <sup>3</sup> /1000 strokes |                                    |  |
| charge-air pressure<br>Full-load delivery without | 900                | 53,0-54,0 | cm³/1000 stroķes              |                                    | 4,0 (4,5)                              |
| charge-air pressure  1.4 title regulation         | 375                | 27,0-33,0 | cm <sup>3</sup> /1000 strokes |                                    | 3,5 (4,5)                              |
| 1 5 Full-speed regulation                         | 1050               | 28,0-34,0 | cm <sup>3</sup> /1000 strokes |                                    |  |
| 1.6 Start   | 100                | min. 97,0 | cm <sup>3</sup> /1000 strokes |                                    |  |
| 1.7 Load-dependent port-closing                   | -                  |           |                               |                                    |  |

| 2. Test Spec        | cincations                                | checking values in brackets (  | )                                  |                         |                           |  |
|---------------------|---|--|------------------------------------|-------------------------|---------------------------|--|
| 2.1 Timing device   | n = rev/min                               | 400<br>1,4-2,2 (1,1-2,5  | 750                                |                         | 000<br>(5.7 <b>-</b> 7.1) |  |
| 2.2 Supply pump     | n = rev/min<br>bar (kgf/cm²)              | 400 2,5-3,1  | <u> </u>                           | 1000 5,2-5,8            | (0,77,17                  |  |
| Overflow delivery   | n = rev/min<br>cm <sup>3</sup> /10 s      | 400<br>55-138 (40-153)   | 55                                 | 1000<br>55-138 (40-153) |                           |  |
| 2.3 Fuel deliveries |   |  |                                    | 3. Dimen                | for assembly              |  |
| Speed control lever | Rot. speed rev/min                        | Fuel delivery<br>cm <sup>3</sup> /1000 strokes   | Charge-air press.<br>bar (kgf/cm²) | Designation             | and adjustment<br>mm      |  |
| End stop            | 1100<br>1050<br>1000<br>900<br>750<br>400 | max. 1,5 (26,0-36,0 48,5-51,5 (47,0-53,0 (50,5-56,5 53,4-57,5 (51,8-59,2 50,0-54,0 (48,3-55,7) | 2)                                 | K<br>KF<br>MS<br>SVS    | 5,1-5,3<br>1,4-1,6<br>1,2 |  |
| switch-off<br>ELAB  | 375                                       |  |                                    | A<br>B                  |                           |  |
| Idle stop  End stop | 375<br>400<br>450<br>130<br>200           | (25,0-35,0<br>10,5-18,5 ( 9,5-19,5<br>max. 1,5<br>min. 97<br>max. 85                           | ))                                 | Observations            |                           |  |
| 2.4 Solenoid        | cut-in voltag                             | min. 10V   |                                    |                         |                           |  |

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WPP 001/4 PEU 1.9 b

2. Edition

VE 4/9 F 2300 R 162

0 460 494 153

Test pressure line 6x2x450 mm / 1 680 750 073

supersede 03.84 company: XUD 9

DHK: 1 688 901 022/130 bar

Overflow temperature 45° C

All test specifications are valid only for Bosch Fuel-injection Pump Test Benches and Testers

Test Instructions and Test Equipment

see VDT-W-460/...

Pre-stroke setting

| 1. Settings                                    | Rot. speed rev/min | Settings  |                               | Charge-air press.<br>bar (kgf/cm²) | Difference in delivery cm <sup>3</sup> |
|--|--------------------|-----------|-------------------------------|------------------------------------|--|
| 1 1 Timing device travel                       | 2000               | 7,8-8,2   | mm                            |                                    |  |
| 1 2 Supply-pump pressure                       | 1250               | 3,9- 4,5  | bar (kgf/cm²)                 |                                    |  |
| 1 3 Full-load delivery with                    | -                  | -         | cm <sup>3</sup> /1000 strokes |                                    |  |
| charge air pressure Full-load delivery without | 1250               | 28,8-29,8 | cm <sup>3</sup> /1000 strokes |                                    | 2,5(3,0)                               |
| charge-air pressure   1 4 Idle regulation      | A 550              | 3,5- 4,5  | cm <sup>3</sup> /1000 strokes |                                    | B 2,5(3,0)                             |
| 1 5 Full-speed regulation                      | 2400               | 19,3-25,3 | cm <sup>3</sup> /1000 strokes |                                    |  |
| 1 6 Start                                      | 100                | min. 44,0 | cm <sup>3</sup> /1000 strokes |                                    |  |
| 1 7 Load-dependent port-closing                | 1250               | ·         |                               |                                    |  |

| 2 1 Timing device                       | n = rev/min<br>mm                                   | 700 0,5-1,5(0,3-1,7)  | 1250<br>3,4-4,2(3,1-4,5) | 2000<br>(7,3-8,7)  |  |  |
|---|---|---|--------------------------|--|--|--|
| 2 2 Supply pump                         | n = rev/min<br>bar (kgf/cm²)                        | 700<br>2,3-2,9  |                          | -  | 000<br>9-6,5                                   |  |
| Overflow delivery                       | n = rev/min<br>cm <sup>3</sup> /10 s                | 600<br>55-138(40-153)   |                          | _  | 300<br>8(40-153)                               |  |
| 2.3 Fuel deliveries Speed control lever | Rot speed   | Fuel delivery   | Charge-air press         | 3. Dimen   | ISIONS<br>tor assembly<br>and adjustment<br>mm |  |
| End stop                                | 2650<br>2500<br>2400<br>2250<br>2000<br>1250<br>700 | max. 7,0<br>10,7-16,7 (9,7-17<br>(18,3-26<br>28,9-30,9 (27,6-32<br>29,7-31,7 (28,4-33<br>(27,0-31<br>29,5-32,5 (28,0-34 | ,3)<br>,2)<br>,0)<br>,6) | K<br>KF<br>MS<br>SVS   | 3,2-3,4<br>5,7-6,0<br>1,3-1,5<br>3,0           |  |
| switch-off                              | 2300  | 0   |                          | A<br>8   |  |  |
| tdle stop                               | A 550<br>B 350<br>C 470                             | 3,5- 4,5<br>8,0-12,0 (6,0-14,<br>8,0-12,0 (6,0-14,<br>min. 40,0   |                          | Observations Residual delivery setting idle sett (LFG) as per VDT- |  |  |
| End stop                                | 300   | max. 35,0   |                          | 460135   |  |  |

46

WPP 001/4 FIA 3,9 a 2. Edition

En

Overflow temperature 45° C

supersedes 3.84 company: Fiat

engine: 8045.05.200

VE 4/11 F 1250 L 164

0 460 414 013 DHK: 1 688 904 020

All test specifications are valid only for Bosch Fuel-Injection Pump Test Benches and Testers

Test Instructions and Test Equipment

see VDT-W-460/...

Pre-stroke setting 0,2 mm

| 1. Settings  | Rot. speed rev/min | Settings           |                               | Charge-air press.<br>bar (kgf/cm²) | Difference in delivery cm <sup>3</sup> |
|--|--------------------|--------------------|-------------------------------|------------------------------------|--|
| 1 1 Timing device travel 1 2 Supply-pump pressure                                | 800<br>800         | 3,8-4,2<br>5,1-5,7 | mm<br>bar (kgf/cm²)           |                                    |  |
| 1.3 Full-load delivery with<br>charge-air pressure<br>Full-load delivery without | 800                | 73,5-74,5          | cm <sup>3</sup> /1000 strokes |                                    | 3,5(4,0)                               |
| charge-air pressure  1 4 Idle regulation   | 350                | 21,0-25,0          | cm³/1000 strokes              |                                    | 3,5(4,0)                               |
| 1 5 Full-speed regulation  | 1350               | 29,0-35,0          | cm³/1000 strokes              |                                    |  |
| 1 6 Start  | 100                | min. 80,0          | cm <sup>3</sup> /1000 strokes |                                    |  |
| 1 7 Load-dependent port-closing  |                    |                    |                               |                                    |  |

| 2. Test Spe       | ecifications                 | checking values in brackets ( | )         |                         |
|-------------------|------------------------------|-------------------------------|-----------|-------------------------|
| 2 1 Timing device | n = rev/min                  | 1,2-2,0 (0,9-2,1)             | (3,3-4,7) | 7,6-8,4 (7,3-8,7)       |
| 2 2 Supply pump   | n = rev/min<br>bar (kgf/cm²) | 500<br>3,6-4,2                |           | 1250<br>7,0-7,6         |
| Overflow delivery | n = rev/min<br>cm³/10 s      | 500<br>55-138 (40-153)        |           | 1250<br>55-138 (40-153) |
|                   |                              |                               |           |                         |

|                     | cm <sup>3</sup> /10 s                      | 55-138 (40-153)  |                                    | 55-13                | 00 (40-100)                       |
|---------------------|--|--|------------------------------------|----------------------|-----------------------------------|
| 2 3 Fuel deliveries |  |  |                                    | 3. Dimen             | sions tor assembly and adjustment |
| Speed control laver | Rot. speed rev/min                         | Fuel delivery cm <sup>3</sup> /1000 strokes  | Charge-air press.<br>bar (kgf/cm²) | Designation          | mm                                |
| End stop            | 1430<br>1380<br>1350<br>1250<br>800<br>500 | max. 1,0<br>6,0-16,0(6,5-15,5)<br>(27,5-36,5)<br>69,5-72,5(68,3-73,7)<br>(71,3-76,7)<br>64,0-67,0(62,1-68,9) |                                    | K<br>KF<br>MS<br>SVS | 5,4-5,6<br>1,5-1,7<br>5,0         |
| switch-off          | 1250                                       | 0  |                                    | A<br>8               |                                   |
| Idle stop           | 500<br>425<br>350<br>150<br>250            | max. 2,0<br>4,0-10,0 (2,5-11,5)<br>(18,5-27,5)<br>min. 90,0<br>max. 65,0                                     |                                    | Observations         |                                   |
| 2.4 Solenoid        | max cut-in vol                             | nage xxx min. 10 V<br>x rated voltage 12V.   |                                    |                      |                                   |

BOSCH

WPP 001/4 MAN 5,6 p1

1. Edition

VE6/12 F 1100 R 166-1

Overflow temperature 45° C

supersedesMAN

company: D 0226 MT E 51

engine:

0 460 426 040

All test specifications are valid only for Bosch Fuel-injection Pump Test Benches and Testers

Test Instructions and Test Equipment

see VDT-W-460/.

|                    | 0,2 |    | - 0,02 | (0,04) |
|--------------------|-----|----|--------|--------|
| Pre-stroke setting |     | mm |        |        |
|                    |     |    |        |        |

| 1. Settings                                    | Rot. speed rev/min | Settings  |                               | Charge-air press.<br>bar (kgf/cm²) | Difference in delivery cm <sup>3</sup> |
|--|--------------------|-----------|-------------------------------|------------------------------------|--|
| 1 1 Timing device travel                       | 700                | 3,3-3,7   | mm                            |                                    |  |
| 1 2 Supply-pump pressure                       | 700                | 4,3-4,9   | bar (kgf/cm²)                 |                                    |  |
| 1 3 Full-load delivery with                    | _                  | *         | cm³/1000 strokes              |                                    |  |
| charge-air pressure Full-load delivery without | 700                | 90,5-91,5 | cm³/1000 strokes              |                                    | 4,0 (4,5)                              |
| charge-air pressure  1 4 Idle regulation       | 300                | 13,0-19,0 | cm³/1000 strokes              |                                    | 3,5 (4,5)                              |
| 1 5 Full-speed regulation                      | 1230               | 18,0-24,0 | cm <sup>3</sup> /1000 strokes |                                    |  |
| 1 6 Start                                      | 100                | min. 80,0 | cm <sup>3</sup> /1000 strokes |                                    |  |
| 1.7 Load-dependent port-closing                | 700                | -         |                               |                                    |  |

| 2 1 Timing device   | n = rev/min<br>mm                    | 500<br>1,5-2,3 (1,2-2,6) | 700<br>(2,8-4,2) | 900<br>3,7-4,5 (3,4-4,8)                  |
|---------------------|--------------------------------------|--------------------------|------------------|---|
| 2 2 Supply pump     | n = rev/min<br>bar (kgf/cm²)         | 500<br>3,3-3,9           |                  | 1100<br>5,9-6,5                           |
| Overflow delivery   | n = rev/min<br>cm <sup>3</sup> /10 s | 500<br>55-138(40-153)    |                  | 1100<br>55-138(40-153)                    |
| 2 3 Fuel deliveries |                                      |                          |                  | 3. Dimensions for assembly and adjustment |

| 2 3 Fuel deliveries |   |   |                                    | 3. Dimer     |
|---------------------|---|---|------------------------------------|--------------|
| Speed control lever | Rot. speed rev/min                          | Fuel delivery<br>cm <sup>3</sup> /1000 strokes                | Charge-air press.<br>bar (kgf/cm²) | Designation  |
| End stop            | 1280<br>1230                                | max. 1,0 (16,0-26,0)  |                                    | к            |
|                     | 1170  | 70,0-78,0 (69,0-79,0)   |                                    | KF           |
|                     | 1100  | 89,5-92,5 (88,0-94,0)   |                                    | MS           |
|                     | 900<br>700<br>500                           | 91,0-95,0 (90,0-96,0)<br>(88,0-94,0)<br>91,0-95,0 (89,3-96,7) |                                    | svs          |
| switch-off          | and a second of the second of the second of |   |                                    | A<br>B       |
| idle stop           | 370<br>330<br>300                           | max. 1,0<br>3,0-9,0 (1,0-11,0)<br>(11,0-21,0)                 |                                    | Observations |
| End stop            | 350<br>450                                  | min. 101<br>max. 101  |                                    |              |
| 2.4 Seleroid        | max. cut-in volt                            | age xxx min. 10 V<br>rated voltage 12V.                       |                                    |              |

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5,7-5,9 0,9-1,1

2,5

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Test Specifications Distributor-type Fuel-injection Pumps 46

WPP 001/4 VMA 2.2 b 2. Edition

n

VE 4/10 F 2100 L 168 0 460 404 038

Overflow temperature 45° C

supersedes VM Motori engine: HR 492 HT

All test specifications are valid only for Bosch Fuel-injection Pump Test Benches and Testers

Test Instructions and Test Equipment

see VDT-W-460/...

Pre-stroke setting mm

| 1. Settings  | Rot. speed rev/min | Settings    |                               | Charge-air press.<br>bar (kgf/cm²) | Difference in delivery cm <sup>3</sup> |
|--|--------------------|-------------|-------------------------------|------------------------------------|--|
|  | 1600               | 4,5 - 4,9   | mm                            | 0,8                                |  |
| 1 1 Timing device travel   | 1600               | 5,6 - 6,2   | bar (kgl/cm²)                 | 0,8                                |  |
| 1 2 Supply-pump pressure   | 1600               | 59,0 - 60,0 | cm <sup>3</sup> /1000 strokes | 0,8                                | 3,0 (3,5)                              |
| 1 3 Full-load delivery with<br>charge-air pressure<br>Full-load delivery without | 1600               | 37,5 - 40,5 | cm³/1000 strokes              | 0                                  |  |
| charge:air pressure  | 400                | 16,0 - 20,0 | cm <sup>3</sup> /1000 strokes | 0                                  | 2,5 (3,5)                              |
| 1 5 Full-speed regulation  | 2300               | 27,0 - 33,0 | cm <sup>3</sup> /1000 strokes | 0,8                                |  |
| 1 6 Start  | 100                | min. 55,0   | cm <sup>3</sup> /1000 strokes | 0                                  |  |
| 1.7 Load-dependent port-closing  |                    |             |                               |                                    |  |

| 2. Test Spe                                     | cifications                  | checking values in brackets ( | )                       |                           |  |
|---|------------------------------|-------------------------------|-------------------------|---------------------------|--|
| 2.1 Timing device n = rev/min<br>LDA=0,8 bar mm |                              | 1000<br>0,9-1,7 (0,6-2,0)     | 1600<br>(4,0-5,4)       | 2100<br>7,0-7,8 (6,7-8,1) |  |
| 22Supplypump<br>LDA=0,8 bar                     | n = rev/min<br>bar (kgf/cm²) | 400<br>1,5-2,1                | 2100<br>7,2-7,8         |                           |  |
| Overflow delivery n = rev/min cm³/10 s          |                              | 500<br>55-138 (40-153)        | 2100<br>55-138 (40-153) |                           |  |
| 2 3 Fuel deliveries                             |                              |                               |                         | 3. Dimensions             |  |

|                     |                      |  | 1.01                              |
|---------------------|----------------------|--|-----------------------------------|
| Speed control lever | Rot speed<br>rev/min | Fuel delivery<br>cm <sup>3</sup> /1000 strokes | Charge-air press<br>bar (kgf/cm²) |
| End stop            | 2450                 | 2,0 - 8,0 (0,5-9,5)                            | 8,0<br>8,0                        |
|                     | 2300                 | (25,5-34,5)                                    | 0,8                               |
|                     | 2100                 | 51,8-54,2 (48,5-57,5)                          | 8,0                               |
|                     | 1600                 | (36,3-41,7)                                    | 0                                 |
|                     | 1600                 | (56,8-62,2)                                    | 0,8                               |
|                     | * 700                | 50,0-51,0 (47,1-53,9)                          | 0,4                               |
|                     | 600                  | 41,5-42,5 (38,6-45,4)                          | 0                                 |
| switch-off          | 2100                 | 0  |                                   |
| Idle stop           | 600                  | max. 1,0                                       |                                   |
|                     | 450                  | 3,5-9,5 (2,0-11,0)                             | ı                                 |
|                     | 400                  | (13,5-22,5)                                    |                                   |
|                     | 400                  | min. 52,0                                      | 1                                 |
| End stop            | 500                  | max. 46,0                                      |                                   |
|                     | 300                  | mux. 70,0                                      |                                   |
| 2 4 Solenoid        | max cut-in volta     | e xxx min. 10 V<br>rated voltage 12V.          |                                   |

| 3. Dimen    | Sions<br>tor assembly<br>and adjustment |
|-------------|---|
| Designation | mm acjosiment                           |
| K           | 3,2 - 3,4                               |
| KF          | 5,7 - 5,9                               |
| MS          | 0,7 - 0,9                               |
| svs         | 3,6                                     |
| A           |   |
| 8           |   |
| compensat   | -pressure<br>tor stroke                 |
| Correction  | n at the nut. (46)                      |

WPP 001/4 PEU 1,7 a

2. Edition

supersede Peugeot company: YUD 7

VE 4/8 F 2300 R 171

0 460 484 010

Pre-stroke setting

Test pressure line 6x2x450 mm / 1 680 750 073

DHK: 1 688 901 022/130 bar

Overflow temperature 45° C

All test specifications are valid only for Bosch Fuel-injection Pump Test Benches and Testers

Test Instructions and Test Equipment

see VDT-W-460/...

| 1. Settings                                    | Rot speed rev/min | Ŝettings  |                               | Charge-air press.<br>bar (kgf/cm²) | Difference in delivery cm <sup>3</sup> |
|--|-------------------|-----------|-------------------------------|------------------------------------|--|
| 1 1 Timing device travel                       | 1250              | 3,8-4,2   | mm                            |                                    |  |
| 1 2 Supply-pump pressure                       | 1250              | 4,3-4,9   | bar (kgf/cm²)                 |                                    |  |
| 1 3 Full-load delivery with                    | -                 | -         | cm <sup>3</sup> /1000 strokes |                                    |  |
| charge-air pressure Full-load delivery without | 1250              | 29,5-30,5 | cm³/1000 strokes              |                                    | 2,5(3,0                                |
| charge-air pressure  1 4 Idle regulation       | A 550             | 3,5- 4,5  | cim³/1000 strokes             |                                    | B 2,0(3,0                              |
| 1 5 Full-speed regulation                      | 2400              | 19,0-25,0 | cm <sup>3</sup> /1000 strokes |                                    |  |
| 1 6 Start                                      | 100               | min. 42,0 | cm <sup>3</sup> /1000 strokes |                                    |  |
| 1.7 Load-dependent port-closing                | 1250              |           |                               |                                    |  |

|                     |   | checking values in brackets ( )  | 1250                               |                      | 2000                                       |
|---------------------|---|--|------------------------------------|----------------------|--|
| 2 1 Timing device   | n = rev/min   | 700<br>0,8-1,6(0,5-1,9)  | 1250<br>(5,3-4,7)                  | 3,0-8                | ,8(7,7-9,1)                                |
| 2 2 Supply pump     | n = rev/min<br>bar (kgf/cm²)                        | 700<br>2,8-3,4   |                                    |                      | 2000<br>6,4-7,0                            |
| Overflow delivery   | n = revianin<br>cm <sup>3</sup> /10 s               |  |                                    | 55-13                | 2300<br>38(40-153)                         |
| 2 3 Fuel deliveries |   |  |                                    | 3. Dimen             | sions<br>for assembly<br>and adjustment    |
| Speed control lever | Rot speed rev/min                                   | Fuel delivery cm <sup>3</sup> /1000 strokes  | Charge-air press.<br>bar (kgf/cm²) | Designation          | mm   |
| End stop            | 2650<br>2500<br>2400<br>2250<br>2000<br>1250<br>700 | max. 7,0 11,5-17,5 (10,5-18,5) (18,0-26,0) 28,0-30,0 (26,7-31,3) 29,0-31,0 (27,7-32,3) (27,7-32,3) 29,5-32,5 (28,0-34,0= |                                    | K<br>KF<br>MS<br>SVS | 3,2-3,4<br>5,2-5,5<br>1,3-1,5<br>max. 3,0  |
|                     | 2300  | 0  |                                    | В                    |  |
| idle stop           | A 550<br>B 350<br>C 470                             | 3,5 - 4,5<br>8,0 -12,0 (6,0-14,0)<br>8,0 -12,0 (6,0-14,0)  |                                    | setting<br>(LFG) a   | l delivery<br>idle setting<br>s per VDT-I- |
| End stop            | 200<br>300  | min. 44,0<br>max. 34,0   |                                    | 460135               |  |
| 2 4 Solenoid        | max. cut-in volta                                   | nge xx min 10 V<br>xirated voltage 12V.  |                                    |                      |  |

46

WPP 001/4 STE 5,0 f 1. Edition

En

VE 6/11 F 1150 R 172 U 460 416 032 Overflow temperature 45° C

supersedes companiteyr engine:WD 611.87

All test specifications are valid only for Bosch Fuel-injection Pump Test Benches and Testers

Test Instructions and Test Equipment

Pre-stroke setting

0,2

see VDT-W-460/...

| 1. Settings  | Rot. speed<br>rev/min | Settings           |                               | Charge-air press.<br>bar (kgf/cm²) | Difference in delivery cm <sup>3</sup> |
|--|-----------------------|--------------------|-------------------------------|------------------------------------|--|
| 4.4 Timing device travel                             | 800                   | 3,5 - 3,9          | mm                            | 0,8                                |  |
| 1 1 Timing device travel                             | 800                   | 5,4 - 6,0          | bar (kgf/cm²)                 | 0,8                                |  |
| 1 2 Supply-pump pressure 1 3 Full-toad detivery with | 800                   | 70,0 - 71,0        | cm³/1000 strokes              | 0,8                                |  |
| charge-air pressure Full-load delivery without       | 500                   | <b>53,5 - 54,5</b> | cm³/1000 strokes              | 0                                  |  |
| charge-sir pressure  1.4 Idle regulation             | 250                   | 6,0 - 20,0         | cm³/1000 strokes              | 0                                  |  |
| 1 5 Full speed regulation                            | 1200                  | 37,0 - 43,0        | cm <sup>3</sup> /1000 strokes | 0,8                                | ,                                      |
| 1 6 Start  | 100                   | min. 80            | cm <sup>3</sup> /1000 strokes | 0                                  |  |
| 1.7 Load-dependent port-closing                      |                       |                    |                               |                                    |  |

| 2 1 Timing device   | n = rev/min                 | 600  |  | 800                                     |             | 1130                       |
|---------------------|-----------------------------|--|--|---|-------------|----------------------------|
| DA = 0.8 bar        | mm                          | 1,4 - 2,2 (1,                                    | 1-2,5)                                     | (3,0 - 4                                | ,4) 6,8-7   | ,6 (6,5-7,9)               |
| 2 2 Supply pump     | n = rev/min                 | 500  |  |   | 1           | 130                        |
| DA = 0.8 bar        | bar (kgf/cm²)               | 3.8 - 4  | ,4   |   | 6,8         | - 7,4                      |
| Overflow delivery   | n ≈ rev/min<br>cm³/10 s     | 500(0<br>55-138 (40                              |  |   |             | 150 (0,8 bar)<br>3(40-153) |
| 2 3 Fuel deliveries |                             |  |  | *************************************** | 3. Dimen    | for assembly               |
| Speed control lever | Rot speed rev/min           | Fuel delivery<br>cm <sup>3</sup> /1000 strokes   |  | Charge-air press.<br>bar (kgf/cm²)      | Designation | and adjustment<br>mm       |
| End stop            | 1310<br>1250<br>1200        | 1  | ,5-40,5                                    | 0,8                                     | K<br>KF     | -<br>5,2 - 5,5             |
|                     | 1130<br>800<br>* 500<br>500 | 71,0 - 74,0 (69<br>(67<br>61,5 - 62,5 (58<br>(50 | ,8-75,2<br>,8-73,2<br>3,6-65,4<br>0,6-57,4 | 0,8                                     | MS<br>SVS   | 1,3 - 1,5                  |
| switch-off          |                             |  |  |   | A<br>B      |                            |
| Idle stop           | 380<br>330                  | max. 1,0<br>min. 2,0                             | - 22,5)                                    |   |             | old-pressure               |
| End stop            | 250<br>170<br>250           | min. 80<br>max. 50                               | - 22,5)                                    |   | = 4,0       | sator stroke<br>mm         |
|                     |                             |  |  | 1                                       |             |                            |

max cut-in voltage test voltage

2 4 Solenoid

**K8** 

11)

150

WPP 001/4 CUM 5,9 g 1. Edition

VE 6/12F 1400 R175

0 460 426 038

supersedes

company:

Cummins

engine:

6 BT-590

Overflow temperature 45° C DHK: 1688 901 016

All test specifications are valid only for Bosch Fuel-injection Pump Test Benches and Testers

Test Instructions and Test Equipment

Pre-stroke setting

0,3

0.02 (0.04)

see VDT-W-460/...

| 1. Settings  | Rot speed rev/min | Settings  |                               | Charge-air press.<br>bar (kgf/cm²) | Difference in delivery cm <sup>3</sup> |
|--|-------------------|-----------|-------------------------------|------------------------------------|--|
|  | 1100              | 2,0-2,4   | mm                            | 0,75                               |  |
| 1.1 Timing device travel   | 1100              | 4,3-4,9   | bar (kgf/cm²)                 | 0,75                               |  |
| 1.2 Supply-pump pressure   | 1100              | 86,0-87,0 | cm³/1000 strokes              | 0,75                               | 4,0 (4,5)                              |
| 1.3 Full-load delivery with charge air pressure                          | 500               | 73,5-74,5 | cm³/1000 strokes              | 0                                  |  |
| Full-load delivery without<br>charge-air pressure<br>1.4 ldle regulation | 375               | 20,0-26,0 | cm <sup>3</sup> /1000 strokes | 0                                  | 3,5 (4,5)                              |
| 1.5 Full-speed regulation  | 1600              | 31,0-39,0 | cm <sup>3</sup> /1000 strokes | 0,75                               |  |
| 1 6 Start  | 100               | min. 97,0 | cm <sup>3</sup> /1000 strokes | 0                                  |  |
| 1.7 Load-dependent port-closing  | -                 |           |                               |                                    |  |

| 2. Test Specif                  | fications                    | checking values in brackets t | )   |                 |                   |
|---------------------------------|------------------------------|-------------------------------|---|-----------------|-------------------|
| 21 Timing device In             | n rev/min                    | 900<br>0,4-1,2 (0,1-1,5)      | 1100<br>(1,5-2,9)   | 2,9-3,7         | 1400<br>(2,6-4,0) |
| 22 Supply pump<br>LDA = 0,75 ba | n = rev/min<br>bar (kgf/cm²) | 2,0-2,6                       | , gassa eri sin kirasaganga sahu kabir i najari kecamanan d | 1400<br>5,6-6,2 |                   |
|                                 | n = rev/min<br>cm³/10 s      |                               |   |                 |                   |

| Speed control lever  | Rot speed rev/min                                    | Fuel delivery<br>cm³/1000 strokes  | Charge-air press<br>bar (kgf/cm²)           |
|----------------------|--|--|---|
| End stop  switch-off | 1750<br>1600<br>1400<br>1250<br>1100<br>* 750<br>500 | max. 1,5<br>(30,0-40,<br>79,5-82,5 (78,0-84,<br>82,5-85,5 (81,0-87,<br>(83,5-89,<br>80,0-81,0 (77,5-83,<br>(70,3-77, | (0) 0,75<br>(0) 0,75<br>(5) 0,75<br>(5) 0,3 |
| Idle stop            | 450<br>375<br>300<br>130<br>200                      | max. 1,5<br>(18,0-28<br>35,0-43,0 (34,0-44<br>min. 97,0<br>max. 85,0   | * *   |
| 2 4 Solenoid         | max. cut-in vol                                      | XX IIIII. 10 1010  |   |

| 3. Dimer     | 18ions<br>tor assembly<br>and adjustment |
|--------------|--|
| Designation  | mm                                       |
| к            | -  |
| KF           | 5,1-5,                                   |
| MS           | 1,4-1                                    |
| SVS          | 2,4                                      |
|              |  |
| •            |  |
| В            |  |
| В            |  |
| Observations |  |
| Stop che     | eck electric                             |

shutoff device at 375 min/1. Manifold-pressure compensator stroke =4,5 mm

BÔSCH

# Test Specifications Fuel Injection Pumps (A) and Governors

WPP 001/4 MB 5,7 11 1. Edition

En

PES 6 A 80 C 410 RS 2085 EP/RSV 300-900 A 7 B 528

supersedr s

company Daimler-Benz

endine OM 352

Aggregat - 75 PS

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

# A. Fuel Injection Pump Settings

Port closing at prestroke (2,15-2,25 (2,10-2,30)

mm (from BDC)

| Rotational speed | Control rod  | Fuel delivery                   | Difference                           | Control rod travel | Fuel delivery                     | Spring pre-tensioning (torque-control valve) |
|------------------|--------------|---------------------------------|--------------------------------------|--------------------|-----------------------------------|--|
| rev/min          | mm 2         | cm1/100 strokes<br>3            | cm <sup>-/</sup><br>100 strokes<br>4 | mm<br>2            | cm <sup>1</sup> /100 strokes<br>3 | mm<br>6                                      |
| 1000             | 9            | 5.5-6.0                         | 0,4                                  |                    |                                   |  |
| 200              | 6<br>15<br>6 | 2,2-3,0<br>11,5-12,8<br>1,3-2,2 |                                      |                    |                                   |  |

Adjust the fuel delivery from each outlet according to the values in

#### **B.** Governor Settings

|         | rated speed<br>Control rod<br>travel<br>mm |                    | Interme | diate ra | led sp ∘d      | Control lever deflection in degrees 7 | Lowe<br>rev/min<br>8 | Control rod<br>travel<br>mm | rev/min | rque control<br>  Control rod<br>  travel<br>  mm<br>  11 |
|---------|--|--------------------|---------|----------|----------------|---------------------------------------|----------------------|-----------------------------|---------|---|
| ca.49,5 | 900<br>920<br>930                          | 16,0<br>9,6<br>4,8 | with    |          | uxilian<br>0,5 | y spring                              | -                    | •                           | -       | -   |
| ca.48   | 900<br>920<br>950                          | 0 - 1.0            |         | **       | liary s        |                                       |                      |                             |         | 200 020 min/  |

Set idle auxiliary spring so that 2.5 mm control-rod travel is reached at n=920-930 min/1 The numbers denote the sequence of the tests

## C. Settings for Fuel Injection Pump with Fitted Governor

|         | ill load slop<br>emp 40 C (104 F) | B Rotational speed limitat | 30 Fu        | iel delivery<br>paracteristics | Starting f | uel delivery 5       |   | stop              |
|---------|-----------------------------------|----------------------------|--------------|--------------------------------|------------|----------------------|---|-------------------|
| rev/min | cm <sup>-</sup> /1000 strokes     | changed to ) rev/min 3     | rev/min<br>4 | cm·/1000 strokes<br>5          | rev/min    | cm/1000 strokes<br>7 |   | travet<br>mm<br>9 |
| 880     | 48,0-50,0<br>(46,5-51,5)          | 900                        | -            | -                              | 100        | 13,2-13,8<br>mm RW   | - | -                 |

Checking values in brackets

\* 1 mm less control to the than col 2

4.84

BOSCH

Geschaftsbereich KH. Kundendienst. Kfz-Ausrustung. c. 1980 by Robert Bosch GmbH. Postfach 50. D-7000 Stuftgart 1. Printed in the Federal Republic of Germany Imprime en Republique Fédérale d'Allemagne par Robert Bosch GmbH.

Testoil-ISO 4113

# **Test Specifications** Fuel Injection Pumps (A) and Governors

WPF 001/4 MB 5,7 L 3. Edition

PES 6 A 80 C 410 RS 2085

EP/RSV 575-1100 A 7 B 533 DL

supersedes 6.70

company Daimler-Benz

OM 352

Komb.-Nr. 0 400 876 174

Mandrescher - 108 PS

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

# A. Fuel Injection Pump Settings

2,15-2,25 Port closing at prestroke (2.10-2.30)

mm (from BDC)

| Rotational speed | Control rod<br>travel | Fuel delivery                   | Difference                            | Control rod travel | Fuel delivery                     | Spring pre tensioning<br>(torque-control valve) |
|------------------|-----------------------|---------------------------------|---------------------------------------|--------------------|-----------------------------------|---|
| rev/min          | mm 2                  | cm /100 strokes<br>3            | cm <sup>-</sup> /<br>100 strokes<br>4 | mm<br>2            | cm <sup>1</sup> /100 strokes<br>3 | mm<br>6   |
| 1000             | 9                     | 5,5-6,0                         | 0,4                                   |                    |                                   |   |
| 200              | 6<br>15<br>6          | 2,2-3,0<br>11,5-12,8<br>1,3-2,2 |                                       |                    |                                   |   |

Adjust the fuel delivery from each outlet according to the values in E

#### **B.** Governor Settings

| 1      | r rated speed<br>Control rod<br>travel<br>mm |                               | Interme | ediate rate      | d speed | Control-<br>lever<br>deflection<br>in degrees<br>7 | Lower<br>rev/min<br>8 | rated speed<br> Control rod<br> travel<br> mm<br> 9 | 11 9 1             | rque control<br>Control rod<br>travel<br>mm |
|--------|--|-------------------------------|---------|------------------|---------|--|-----------------------|---|--------------------|---|
| ca.56, | 1100<br>1110<br>1120                         | 12,0 wit<br>7,0<br>2,4        |         | auxil<br>( = 1,( |         | pring.25   | 575<br>200<br>575     | 5,0<br>19-21<br>4,7-5,3                             | 1080<br>900<br>650 | 0<br>0,1-0,3<br>0,3-0,5                     |
| ca.56  | 1100<br>1130<br>1180                         | 8,2-9,4<br>3,0-4,4<br>0 - 1,0 | 1       | auxil            | iary :  | pring  | 600<br>660            | 2,8-4,0<br>0 - 1,0                                  |                    | 0,3-0,3                                     |

Set idle auxiliary spring so that 3.0 mm control-rod travel is reached at n = 1140 - 1150 min/1.

#### C. Settings for Fuel Injection Purnp with Fitted Governor

|                        | ill load stop                             | Rotational- speed limitat   |         | iel delivery<br>paracteristics     | Starting ( | uel delivery 5     | <b>49</b> Idl | e stop                           |
|------------------------|---|-----------------------------|---------|------------------------------------|------------|--------------------|---------------|----------------------------------|
| Test oil to<br>rev/min | emp 40°C (104 F)<br>cm*/1000 strokes<br>2 | Note changed to ) rev/min 3 | rev/min | cm <sup>1</sup> /1000 strokes<br>5 | rev/min    | cm/1000 strokes    | rev/min<br>8  | Control rod<br>travel<br>mm<br>9 |
| 1230                   | 56,0-57,0<br>(54,5-58,5)                  | 1100                        | 800     | 52,5-55,5<br>(51,0-57,0)           | 100        | 13,2-13,8<br>mm RW | 575           | 5,0                              |
|                        |   |                             | 500     | 48,0-51,0<br>(46,5-52,5)           |            |                    |               |                                  |
|                        |   |                             |         |                                    |            |                    |               |                                  |

Checking values in brackets

4.84

Geschaftsbereich KH. Kundendienst. Kfz-Ausrustung. c. 1980 by Robert Bosch GmbH. Postfach 50. D-7000 Stuttgart 1. Printed in the Federal Republic of Germany Imprime en Republique Fédérale d. Allemagne par Robert Bosch GmbH.

# Test Specifications Fuel Injection Pumps 2 and Governors

40

WPP 001/4 RAB 9,7a 2 1. Edition

PES 6 A 95 D 410 RS 2108

RQ 200/1000 AB 647 L

supersedes company.Raba

Komb.-Nr. 0 400 846 270

engine D 2156 HM 6

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

#### A. Fuel Injection Pump Settings

Port closing at prestroke

(1.65-1.85)

mm (from BDC)

| Rotational speed rev/min | Control rod<br>travel<br>mm | Fuel delivery  cm³/100 strokes | Difference<br>cm <sup>3</sup> /<br>100 strokes<br>4 | Control rod<br>travel<br>mm<br>2 | Fuel delivery  cm <sup>3</sup> /100 strokes 3 | Spring pre-tensioning<br>(torque-control valve)<br>mm<br>6 |
|--------------------------|-----------------------------|--------------------------------|---|----------------------------------|---|--|
| 1000                     | 9,0                         | 7,5-8,0                        | 0,35(0,6)   |                                  |   |  |
|                          | 6,0                         | 3,2-4,2                        |   |                                  |   |  |
| 200                      | 6,0                         | 0,5-1,4                        |   |                                  |   |  |
|                          |                             |                                |   |                                  |   |  |

Adjust the fuel delivery from each outlet according to the values in

#### **B.** Governor Settings

| Checkin<br>PRG che | g of slider                 | Full-load s |                         | -                                 | cifications (4)                     | Idle spec | _                                 |                          | cifications (5)                    | Torque o |                                   | 3 |
|--------------------|-----------------------------|-------------|-------------------------|-----------------------------------|-------------------------------------|-----------|-----------------------------------|--------------------------|------------------------------------|----------|-----------------------------------|---|
| rev/min            | Control rod<br>travel<br>mm | rev/min     | Control rod travel mm 4 | Control<br>rod travel<br>rnm<br>5 | rev/min                             | rev/min   | Control<br>red travel<br>rnm<br>8 | rev/min<br>9             | Control rod<br>travel<br>mm<br>10  | rev/min  | Control rod<br>travel<br>mm<br>12 |   |
| 450                | 15,7-16,3                   | 450         | 16,0                    | 1000<br>1040<br>1080<br>1100      | 15,7-16,0<br>4,0-12,0<br>0-4,6<br>0 | 440       | 0                                 | 100<br>200<br>300<br>340 | 7,0-8,1<br>4,6-6,7<br>0 - 2,6<br>0 | -        | -                                 |   |

Torque-control travel on flyweight assembly dimension a

mm

Speed regulation. At

1 mm less control rod travel

#### C. Settings for Fuel Injection Pump with Fitted Governor

|         | elivery on control lever np 40°C (104°F) | Control rod stop 3a | Fuel delive  | ery characteristics 3b                                      | Starting for<br>Idle spee | Control   |
|---------|--|---------------------|--------------|---|---------------------------|---|
| rev/min | cm <sup>3</sup> /-1000 strokes<br>2      | rev/min<br>3        | rev/min<br>4 | cm <sup>3</sup> /-1000 strokes<br>5                         | rev/min<br>6              | rad fravel<br>cm <sup>3</sup> /1000 strokes / mm<br>7 |
| 1000    | 107,5-109,5<br>(105,5-111,5)             |                     | 700<br>500   | 104,5-107,5<br>(102,0-110,0<br>108,5-111,5<br>(106,0-114,0) | -                         | -   |

Checking values in brackets

9.84

BOSCH

# **Test Specifications** Fuel Injection Pumps and Governors

WPP 001/4 0MB 7,4 b

2. Edition

estoil-ISO 4113

PES 6 A 90 D 410 RS2494

RQ 275/1300 AB954D (1)

supersedes 5.76 company O M B

CP 3 - 130

RQV 250-1300 AB961D (2) PES 6 A 90 D 410 RS2502 Komb.-Nr. 0 400 846 375 (1) 0 400 846 386 (2)

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

| Port closing at prest |             | 2,15-2,25<br>2,10-2,30) | mm (from BDR)                   | = 9,0-1               | 2,0 mm; Zyl.     | 5   |
|-----------------------|-------------|-------------------------|---------------------------------|-----------------------|------------------|---|
| Rotational speed      | Control rnd | Fuel delivery           | Difference<br>cm <sup>-</sup> / | Control rod<br>travel | Fuel delivery    | Spring pre-tensioning<br>(torque-control/valve) |
| roy/min               | mm          | cm //100 strokes        | 100 strokes                     | mm                    | cm 1/100 strokes | mm<br>6   |
| 1                     | 2           | 3                       | 4                               | 2                     | 3                |   |
| 1300                  | 14,0+0,     | 1 8,2 - 8,3             | <b>_</b> 0,3(0,45)              | 12,2+0,1              | 8,4 - 8,5        |   |
| 275                   | 8,9-9,1     | 1, 1 - 1,7              | 0,2(0,4)                        | 9,9-10,1              | 2,9-3,3          | n=250 min <sup>-1</sup>                         |

**B.** Governor Settings

RO .. 954D

| r<br>  Checlung | of slider                   | Full load s | speed re              | gulation                     |                                       | Idle spec | •                     |                          |  | Torque o   | ontrol                            |
|-----------------|-----------------------------|-------------|-----------------------|------------------------------|---------------------------------------|-----------|-----------------------|--------------------------|--|------------|-----------------------------------|
| 1               | Control rod<br>travel<br>mm | Setting pro | Control<br>rod travel |                              | chications Control rod travel mm 6    |           | Control red travel mm |                          | cilications<br>Control rod<br>travel<br>mm<br>10 | rev/min    | Control rod<br>travet<br>mm<br>12 |
| 1050            | 15,0-15,8                   | 1050        | 15,4                  | 1320<br>1390<br>1440<br>1530 | 14.0-15.4<br>7.4-12.0<br>0 - 3.2<br>0 |           | 0                     | 100<br>250<br>400<br>530 | 6,4-8,1<br>5,0-7,9<br>2,0-4,2<br>0               | 700<br>900 | 15,6-15,8<br>15,4-15,6            |

Torque control travel

0,2

Speed regulation At = 1360 =

1 mm tess control rod travel

# C. Settings for Fuel Injection Pump with Fitted Governor

| governor C  | elivery on<br>control lever<br>np. 40: C (104 F) | Cantrol rad stop | Fuel deliv   | ery characteristics          | Starting fuel delivery |                    |
|-------------|--|------------------|--------------|------------------------------|------------------------|--------------------|
| revimm<br>1 | cm <sup>1</sup> /-1000 strokes                   | rev/min<br>3     | rev/min<br>4 | cm*/-1000 strokes<br>5       | rev/min                | cm³/100 strokes    |
| 1300        | 81,5 - 82,5<br>(79,5 - 84,5)                     | 600              | 800          | 78,5 - 81,5<br>(76,5 - 83,5) | -                      | -                  |
| !           | (17,5  |                  | 500          | 72,0 - 75,0<br>(70,0 - 77,0) |                        |                    |
|             |  |                  | ;            |                              | 1455-<br>Cont          | 1465<br>rol switch |

Checking values in brackets

5.84

Geschaftsbereich KH. Kundendienst. Kfz Ausrustung. 1980 by Robert Bosch GmbH. Postfach 50. D. 7000 Stuttgart 1. Printed in the Federal Republic of Germany Imprime en Republique Federale d Allemagne par Robert Bosch GmbH.

| Upper rated                           | sneed                           |                                       | Intermediate             | e rated spe | ed                            | Lower rated                           | speed      |                               | Sliding sl | eeve travel        |
|---------------------------------------|---------------------------------|---------------------------------------|--------------------------|-------------|-------------------------------|---------------------------------------|------------|-------------------------------|------------|--------------------|
| Degree of deflection of control lever | rev/min<br>Control<br>rodtravel | Control rod (1a travel mm rev/min (2a | deflection<br>of control | rev/min     | control rod<br>travel<br>mm 4 | Degree of deflection of control lever | rev/min    | Control rod<br>travel<br>mm 3 | rev/min    | mm<br>             |
| ca.66                                 | 1350                            | 15,0-17,                              | 6 -                      | -           | -                             | ca.21                                 | 100<br>250 | min.11,5                      |            | 1,0-2,0<br>4,0-4,5 |
| ca.62                                 | 11,3                            | 1340-135<br>1465-149                  | o<br>5                   |             |                               |                                       |            | 840=2,0                       | 1350       | 8,2                |
|                                       | 1600                            | 0 - 1,                                | o                        |             |                               | 250-70                                | 0          |                               |            |                    |

Torque control travel a 0,2 mm

C. Settings for Fuel Injection Pump with Fitted Governor

| rtop<br>5 40°C (104 F) (2)   | Rotational-speed (2b) imitation intermediate speed | Fuel deliv<br>high idle s    | rery characteristics (5a) speed (5b)   | TMIC   |   | Torque-<br>travel  | Control rod   |
|------------------------------|--|------------------------------|--|--|---|--|---|
| rm (1000) strokes            | rev/min 4a   | rev/min                      | cm 1/1000 strokes  | rev/min  | cm /1000 strokes<br>7   | rev/min<br>8   | travel<br>mm<br>9   |
| 84,0 - 85,0<br>(82,0 - 87,0) | 1340-1350 *  | 800<br>500                   | 82,0 - 85,0<br>(80,0 - 87,0)<br>74,0 - 76,0  | 100  | 112,0-124,0<br>(109,0-127,0<br>= 16,0-16,6<br>mm RW   | 1300<br>3000<br>700<br>500   | 12,3+0,<br>12,3+0,<br>12,4+0,<br>12,5+0,  |
|                              |  |                              | (72,0 - 78,0)  |  |   | ŧ.   |   |
|                              | 100 C (104 F) 2  177 (100) strakes 2  84,0 - 85,0  | rrr /1(00) strokes rev/min 3 | minimation   might idle s   minimation   might idle s   minimation | minimation   minimation   mightible speed (56)   minimation   minima | milation   milation | Imitation   Imit | Rotational speed   28   Holation   Initialization   Intermediate speed   1000 strokes   1340-1350 *   1340-1350 |

Checking values in brackets

Testoil-ISO 4113

**B.** Governor Settings

| Upper rate | d speed   |              |        | Intermediate         | rated spe | ed          |   | Lower rated          | speed    |           |    | Sliding sl | eeve travel | ۱ |
|------------|-----------|--------------|--------|----------------------|-----------|-------------|---|----------------------|----------|-----------|----|------------|-------------|---|
| Degree of  |           | Control rod  | (1a)   | Degree of dellection | 1         | Control roo | đ | Degree of deflection | l        | Control r | od | ١          | $\odot$     |   |
| of control | rodtravel |              | (2a)   | of control<br>lever  | rev/min   | mm          | 4 | of control<br>lever  | rev/min  | mm        | 3  | rev/min    | យយ          |   |
|            | 2         | 3            | $\cup$ | 4                    | 5         | 6           |   | 7                    | 8        | 9         |    | 10         | 11          |   |
| +'         | <b>*</b>  | [ <b>3</b> ] |        |                      |           |             |   |                      |          |           |    |            |             |   |
|            |           | İ            |        |                      | 1         |             |   |                      | <b>\</b> |           |    |            |             |   |
|            |           |              |        |                      |           |             |   |                      | ]        |           |    |            |             |   |
| !          |           |              |        | İ                    | Ì         |             |   |                      |          |           |    | 1          |             |   |
|            |           |              |        | 1                    | Ì         |             |   |                      | 1        |           |    |            |             |   |
|            |           |              |        |                      |           |             |   | (3a)                 | ļ        |           |    |            |             |   |
|            |           |              |        |                      |           |             |   |                      |          |           |    |            | L           |   |

C. Settings for Fuel Injection Pump with Fitted Governor

| Full load de<br>Control-roo<br>Test oil ten | elivery<br>d stop<br>np 40°C (104°F) 2 | Intermediate speed | ]       | rery characteristics (5a)          | Starting<br>Idle<br>switchin | fuel delivery 6 | travel       | Control rod |
|---|--|--------------------|---------|------------------------------------|------------------------------|-----------------|--------------|-------------|
| rev/min                                     | cm <sup>1</sup> /1000 strokes          | rev/min 3          | rev/min | cm <sup>3</sup> /1000 strakes<br>5 | rev/min<br>6                 | 7               | rev/min<br>8 | 9           |
| ·····                                       |  |                    |         |                                    |                              |                 |              |             |
|   |  |                    |         |                                    |                              |                 |              |             |
|   |  |                    |         |                                    |                              | 1               |              |             |
| :   |  |                    |         |                                    |                              |                 | <u> </u>     |             |

# **Test Specifications** 2 Fuel Injection Pumps (2) WPP 001/4 MAN 16,0 d 1

and Governors

1. Edition

PE 10 A 90 D 520/5 LS 2515 RQ 250/1250 AB 1170-2R Komb.-Nr. 0 400 649 228 1-8-7-6-3-5-2-10-9-4 0-27-72-99-144-171-216-243-288-315° ± 0,5° (± 0.75°) supersedes

company MAN

D 2530 MF

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

#### A. Fuel Injection Pump Settings

1,5-1,6mm (from BDCZV1. 10 Port closing at prestroke (1.45 - 1.65)

|                  |                         | 43-1,037                                      |  |                             |   |  |
|------------------|-------------------------|---|--|-----------------------------|---|--|
| Rotational speed | Control rod<br>travel * | Fuel delivery<br>cm <sup>3</sup> /100 strokes | Difference<br>cm <sup>3</sup> /<br>100 strokes | Control rod<br>travel<br>mm | Fuel delivery  cm <sup>3</sup> /100 strokes | Spring pre-tensioning (torque-control valve) |
| ,                | *                       | 3   |  |                             | 13  | 0  |
| 1250             | 11,5+0,1                | 10,3-10,4                                     | -0,3(0,45)                                     |                             |   |  |
| 250              | 7,4-7,6                 | 0,9-1,5                                       | 0,25(0,4)                                      |                             |   |  |
|                  |                         |   |  |                             |   |  |
|                  |                         |   |  | :                           |   |  |
|                  |                         |   |  | L                           |   |  |

Adjust the fuel delivery from each outlet according to the values in

#### **B. Governor Settings**

| Checking | g of shder            | Full-load  | speed re              | gulation                    |                        | Idle spe    | ed regula             | tion                       |   | Torque o | control  |
|----------|-----------------------|------------|-----------------------|-----------------------------|------------------------|-------------|-----------------------|----------------------------|---|----------|--|
| PRG che  | ( ' /                 | Setting po |                       |                             | cifications (4)        | ) Setting ( |                       | Test spe                   | cifications (5)                             |          | (3   |
|          | Control rod<br>travel | rev/min    | Control<br>red travel | Control<br>red travel<br>mm | rev/min                | rev/min     | Control<br>rod travel | rev/min                    | Control rod<br>travel                       | rev/min  | Control rod<br>travel                            |
| 1        | 2                     | 3          | 4                     | 5                           | 6                      | 7           | 8                     | 9                          | 10  | 11       | 12   |
| 600      | 15,6-16,4             | 600        | 16,0                  | 10,5<br>4,0                 | 1295-1310<br>1365-1395 |             | 6,0                   | 100<br>250<br>360-4<br>500 | min. 7,5<br>5,9-6,1<br>00 = 2,0<br>max. 1,0 | 600      | 11,5-11,6<br>12,1-12,2<br>11,9-12,1<br>11,5-11,8 |
|          |                       |            | 0.20                  |                             | <u> </u>               |             |                       | l                          | L   | L        | L  |

0,30 mm Torque-control travel on flyweight assembly dimension a =

Speed regulation At 1295-1310 min

1 mm less control rod travel

## C. Settings for Fuel Injection Pump with Fitted Governor

| governor     | delivery on control lever pp 40°C (104°F) | Control rod stop 3a | Fuel deliv | ery characteristics 3b         | Starting for | uel delivery<br>d<br>  Control                      |
|--------------|---|---------------------|------------|--------------------------------|--------------|---|
| rev/min<br>1 | cm <sup>3</sup> /-1000 strokes<br>2       | rev/min<br>3        | rev/min    | cm <sup>3</sup> /-1000 strokes | rev/min<br>6 | red trai<br>cm <sup>3</sup> /1000 strokes / mm<br>7 |
| 1250         | 102,5-103,5<br>(100,5-105,5)              | -                   | 800        | 95,5-98,5<br>(93,5-100,5)      | 100          | 133,0-143,0<br>(130,0-146,0)                        |
|              |   |                     | 500        | 90,0-94,0<br>(88,0-96,0)       | 250 \$       | 6,5 mm RW   |
| ,            |   |                     |            |                                |              |   |

Checking values in brackets

7.84

BOSCH

Geschaftsbereich KH. Kundendienst. Kfz-Ausrustung. 
4. 1980 by Robert Bosch GmbH, Postfach 50, D-7000 Stuttgart 1. Printed in the Federal Republic of Germany Imprime en République Fédérale d'Aliamagne par Robert Bosch GmbH.

WPP 001/4 KHD 1 g 8

3. Edition

PES 4 A 85 D 410/3 RS 2610 Komh.-Nr. 0 400 864 055

RSV 325-1150 A 8 B 2163 L A 8 C 2163 L supersede9.83

company KHI)

engine F 4 L 913 55 kW (75 PS) bei 2300 min 1

Schlepper DX 80 Identification S 16

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke

mm (from BDC)

| Rotational speed | Control rod<br>travel | Fuel delivery        | Difference               | Control rod<br>travel | Fuel delivery        | Spring pre-tensioning (torque-control valve) |
|------------------|-----------------------|----------------------|--------------------------|-----------------------|----------------------|--|
| rev/min<br>1     | mm<br>2               | cm³/100 strokes<br>3 | cm³/<br>100 strokes<br>4 | mm<br>2               | cm³/100 strokes<br>3 | mm<br>6                                      |
| 1150             | 11,3+0,1              | 6,8 - 6,9            | 0,3(0,45)                |                       |                      |  |
| 325              | 9,1-9,                | 1,5 - 1,9            | 0,2(0,4)                 |                       |                      |  |
|                  |                       |                      |                          |                       |                      |  |
|                  |                       |                      |                          |                       |                      |  |

Adjust the fuel delivery from each outlet according to the values in

#### **B.** Governor Settings

| Upper  | rated speed         | _,                                | Intermediate                          | rated spe | ed                          | 4 Lower  | rated spe    |                             |               | que control                 |
|--|---------------------|-----------------------------------|---------------------------------------|-----------|-----------------------------|--|--------------|-----------------------------|---------------|-----------------------------|
| Degree of<br>deflection<br>of control<br>lever | rev/min             | Control rod<br>travel<br>mm       | Degree of deflection of control lever | rev/min   | Control rod<br>travel<br>mm | Degree of<br>deflection<br>of control<br>fever | rev/min<br>8 | Control rod<br>travel<br>mm | rev/min<br>10 | Control rod<br>travel<br>mm |
| loose  | 800                 | 0,3-1,0                           | -                                     | -         | -                           | ca. 19   | 325          | 8,7                         | 1150          | 1,3+0,1                     |
| 10030  | x = 1               | .5                                |                                       |           |                             |  |              | min.19,0                    | 1             | 12,1+0,1<br>11,8+0,2        |
| €a.55  | 10,3<br>4,0<br>1400 | 1190-1200<br>1245-1275<br>0,3-1,7 |                                       |           |                             |  |              | 9,1-9,3<br>30= 2,0          | 900           | 11,6+0,                     |

The numbers denote the sequence of the tests

# C. Settings for Fuel Injection Pump with Fitted Governor

| 2 Full-lo                     | ad stop                  | 6 Rotational-<br>speed limitat.      | (3a) Fuel delivery characteristics |                                    |              | fuel delivery    | 5a) Idle stop |                                  |  |
|-------------------------------|--------------------------|--------------------------------------|------------------------------------|------------------------------------|--------------|------------------|---------------|----------------------------------|--|
| Test oil temp<br>rev/min<br>1 | cm³/1000 strokes         | Note<br>changed to .<br>rev/min<br>3 | rev/min                            | cm <sup>3</sup> /1000 strokes<br>5 | rev/min<br>6 | cm v1000 strokes | rev/min<br>8  | Control rod<br>travel<br>mm<br>9 |  |
| 1150                          | 68,0-69,0<br>(66,0-71,0) | 1190-1200*                           | 300                                | 65,0-67,0<br>(63,0-69,0)           | -            | -                | -             | -                                |  |
|                               |                          |                                      | 500                                | 58,0-61,0<br>(55,5-63,5)           |              |                  |               |                                  |  |
|                               |                          |                                      |                                    |                                    |              |                  |               |                                  |  |

Checking values in brackets

\* 1 mm less control rod travel than col 2

WPP 001/4 EIC 3,9 c

5. Edition

PES 4 A 90 D 320 RS 2634

RSV 300-1025 A 1 B 2153 R

1 - 2 - 4 - 3 je  $90^{\circ} + 0.5^{\circ} (\pm 0.75^{\circ})$ 

Komb. - Nr. O 400 874 235

supersede5.84

company Eicher EDL 4-2

65 kW (88 PS)

All test specifications are valid for Bosch Fuel Injection Pump Test Banches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke

mm (from BDC# RW=9.0 - 12.0 mm

| arpres           | lione        | (5,12-5,33)     |                      |                       |                 |  |
|------------------|--------------|-----------------|----------------------|-----------------------|-----------------|--|
| Rotational speed | Control rost | Fuel delivery   | Difference           | Control rod<br>travel | Fuel delivery   | Spring pre-tensioning (spring control valve) |
| rev/min          | mm           | cm³/100 strokes | cm³/<br>100 stroke's | mm                    | cm³/100 strokes | in in the second                             |
| 1                | 2            | 3               | 4                    | 2                     | 3               | <b>*</b>                                     |
| 1025             | 12,6+0,1     | 8,1 - 8,2       | 0,2(0,45             |                       |                 |  |
| 300              | 10,9+0,2     | 4,4 - 4,9       | 0,2(0,4)             |                       |                 |  |
| •                |              |                 |                      |                       |                 |  |
|                  |              |                 |                      |                       |                 |  |
|                  |              | · ·             | 1                    | ì                     |                 |  |

Adjust the fuel delivery from each outlet according to the values in [

**B.** Governor Settings

| Upper of Degree of deflection of control lever |                     | Control rod<br>travel<br>mm<br>3  | Intermediate<br>Degree of<br>deflection<br>of control<br>fever |   | Control rod<br>travel<br>mm | Degree of deflection of control lever | rated spe<br>rev/min<br>8 | Control rod<br>travel | $\sim$     | que control<br>Control rod<br>travel<br>mm<br>11 |
|--|---------------------|-----------------------------------|--|---|-----------------------------|---------------------------------------|---------------------------|-----------------------|------------|--|
| loose  | 003                 | 0,3 - 1,0                         | -  | - | -                           | ca. 16                                | 300                       | 10,5                  | 1025       | 12,6+0,1   |
| 100.50   | x =                 | 2,25                              |  |   |                             |                                       | 300                       | 10,9-11,1             | 500<br>895 | 13,2+0,1<br>12,9+0,2                             |
| S. 46  | 11.6<br>4.0<br>1260 | 1065-1075<br>1095-1125<br>0,3-1,0 |  |   |                             |                                       | 400-4                     | 60 =2,0               |            |  |

The numbers denote the sequence of the tests

C. Settings for Fuel Injection Pump with Fitted Governor

| 2 Full-lo   | ad stop                  | 6 Rotational-<br>speed limitat     | (O) Molalional Roby (Col. Col. Col. Col. Col. Col. Col. Col. |                          |                            | fuel delivery      | (5a) Idle stop |                                  |
|---|--------------------------|------------------------------------|--|--------------------------|----------------------------|--------------------|----------------|----------------------------------|
| Test oil temp 40°C (104°F) rev/min cm³/1000 strokes 1 2 |                          | Note<br>changed to<br>rev/min<br>3 | rev/min cm³/1000 strokes 4 5                                 |                          | rev/min cm³/1000 strokes 7 |                    | rev/min<br>8   | Control rod<br>travel<br>mm<br>9 |
| 1025  | 81,0-82,0<br>(79,0-84,0) | 1065-1075*                         | <b>75</b> 0  | 83,5-86,5<br>(81,5-88,5) |                            | 19,5-21,0<br>mm RW | -              | ,-                               |
|   |                          |                                    | 500  | 77,0-79,0<br>(75,0-81,0) |                            |                    |                |                                  |
|   |                          |                                    |  |                          |                            |                    |                |                                  |

Checking values in brackets

• 1 mm less control rod travel than col 2

9.84

Testoil ISO 4113

WPP 001/4 BAO 13,8 a

2. Edition

PE 12 A 90 D 521 RS 2648

RQV 325-1500 AB 1164 R

supersedes 84
Baudouin DF 12 AN, S engine 308 kW

Komb.-Nr. 0 400 650 002

1- 4- 9- 8- 5 - 2 - 11- 10- 3 - 6 - 7 - 12  $0-15-60-75-120-135-180-195-240-255-300-315^{\circ} \pm 0,5^{\circ} (\pm 0,75^{\circ})$ 

Specifications apply to test tubing 1 680 750 015

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Start of delivery marking, mark cylinder 1 at 24° on the timing device.

| Port closing at pret     | stroke                           | (2,10-2,30)  | mm (from BDC)                                       |                                  |  |  |
|--------------------------|----------------------------------|--|---|----------------------------------|--|--|
| Rotational speed rev/min | Control rod<br>travel<br>mm<br>2 | Fuel delivery<br>cm <sup>3</sup> /100 strokes<br>3 | Difference<br>cm <sup>3</sup> /<br>100 strokes<br>4 | Control rod<br>trave!<br>mm<br>2 | Fuel delivery<br>cm <sup>3</sup> /100 strokes<br>3 | Spring pre-tensioning<br>(torque-control valve)<br>mm<br>6 |
| 1500                     | 9,6-9,7                          | 6,2-6,3  | 0,3(0,45  |                                  |  | ]  |
| 325                      | 6,0-6,2                          | 1,1-1,7  | 0,25(0,4  |                                  |  |  |
|                          |                                  |  |   |                                  |  |  |
| į.                       |                                  |  |   | ļ                                | 6  | <b>.</b>   |

Adjust the fuel delivery from each outlet according to the values in [

## **B. Governor Settings**

| Upper rated s | peed             |                        | Intermediate         | rated sp | eed                   | Lower rated          | speed   |                       | Sliding sleeve travel |                    |
|---------------|------------------|------------------------|----------------------|----------|-----------------------|----------------------|---------|-----------------------|-----------------------|--------------------|
|               |                  | travel                 | Degree of deflection |          | Control rod<br>travel | Degree of deflection |         | Control rod<br>travel | _                     | 0                  |
| ef control    | rod travel<br>mm | mm<br>rev/min (28)     | of control           | rev/min  | mm (4)                | of control<br>lever  | rev/min | mm ③                  | rev/min               | mm                 |
| 1,            | 2                | 3                      | 4                    | 5        | 6                     | 7                    | 8       | 9                     | 10                    | 11                 |
| max.          | 1500             | 15,2-17,8              | 1                    | -        | -                     | ca. 13               |         | min.7,5<br>6,0-6,2    | 300<br>700            | 0,9-1,0<br>3,1-3,2 |
| ca. 46        | 4,0              | 1546-1550<br>1595-1625 |                      |          |                       |                      | 355-    | 415=2,0<br>max.1,0    | 1100<br>1500          | 5,1-5,2<br>8,4     |
| 1             | 1700             | 0-1,9                  |                      | <u> </u> |                       | 345-46               | ļ       |                       |                       |                    |
|               |                  |                        |                      | <u>.</u> |                       | <b>3</b> 9           |         |                       |                       |                    |

Torque control travel a =

# C. Settings for Fuel Injection Pump with Fitted Governor

| Full-load of<br>Control-ro<br>Test oil te |                          | Rotational-speed 2b timitation intermediate speed |         |                               | Starting<br>Idle<br>switchir | . —   | Torque-<br>travel | Control rad  |
|---|--------------------------|---|---------|-------------------------------|------------------------------|---|-------------------|--------------|
| rev/min                                   | cm³/1000 strokes         | rev/min 4   | rev/min | cm <sup>3</sup> /1000 strokes | rev/min                      | cm²/1000 strokes                                    | rev/min           | travel<br>mm |
| 1   | 2                        | 3   | 4       | 5                             | 6                            | 7   | 8                 | 9            |
| 1500                                      | 61,5-62,5<br>(59,5-64,5) | 1540-1550*  | -       | -                             | 100                          | 113,0-123,0<br>(110,0-126,0)<br>=19,5-21,0<br>mm RW |                   | -            |

Checking values in brackets

\* 1 mm less control rod travel than col. 2

9.84

# Test Specifications Fuel Injection Pumps (A) and Governors

40

WPP 001/4 EIC 3,9 g 1
4. Edition

En

PES 6 A 80 D 320 RS 2652

RSV 300-1150 A 0 B 2001-2 R A 0 C 2001-2 R supersed 84 Eicher company EDL 6-2

Komb.-Nr. 0 400 876 317

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

## A. Fuel Injection Pump Settings

Port closing at prestroke

2, 15-2,25 (2, 1-2,3)

mm (from BDC)

| Rotational<br>speed<br>rev/min | Control rod travel | Fuel delivery cm <sup>-/</sup> 100 strokes | Difference<br>cm <sup>-7</sup><br>100 strokes | Control rod<br>travel | Fuel delivery | Spring pre-tensioning<br>(forque control valve) |
|--------------------------------|--------------------|--|---|-----------------------|---------------|---|
| 1                              | 2                  | 3  | 4   | 2                     | 3             | 6   |
| 1150                           | 12,0+0,1           | 7,8 - 7,9                                  | 0,25(0,4)                                     |                       |               |   |
| 300                            | 8,3-8,5            | 2,0 - 3,0                                  | 0,2(0,35)                                     | 4                     |               |   |
|                                |                    |  |   | ļ                     |               |   |
|                                |                    |  |   |                       |               |   |

Adjust the fuel delivery from each outlet according to the values in

#### **B.** Governor Settings

| 11.   | riated speed                |  | Intermediate rated speed |   |   | 4   | Lower                 | rated speed                  | 3 Torque control |                             |  |
|---|-----------------------------|--|--------------------------|---|---|---|-----------------------|------------------------------|------------------|-----------------------------|--|
| Degree of<br>deflection<br>of control<br>lever<br>1 | Control rod<br>travel<br>mm | Control rod<br>fravel<br>mm rev/min<br>3 | 4                        | 5 | 6 | Control<br>lever<br>deflection<br>in degrees<br>7 | rev/min<br>8          | Control rod<br>travel<br>mmi | rev/min          | Control rod<br>travel<br>mm |  |
| loose   | 800<br>x =                  | 0,3-1,0<br>4,75                          | -                        | - | • | ca. 25  | 100                   | 7,9<br>min. 19,5             |                  | -                           |  |
| (a. 49  | 11,0<br>4,0<br>1430         | 1190-1200<br>1285-1315<br>0,3-1,7        |                          |   |   |   | 300<br>450 <b>-</b> 5 | 8,3 - 8,5<br>10 = 2,0        |                  |                             |  |

The numbers denote the sequence of the tests

# C. Settings for Fuel Injection Pump with Fitted Governor

|         | ill load stop                              | Rotational speed limital (3a) Fuel delivery characteristics |              |   | Starting tidle   | uel delivery 5        | <b>4a</b> Irdi |                             |  |
|---------|--|---|--------------|---|------------------|-----------------------|----------------|-----------------------------|--|
| rev min | emp 40 C (1()4 F)<br>cm*/1000 strokes<br>2 | Note changed to 1 revimin 3                                 | revimin<br>4 | cm <sup>-</sup> /1 <b>00</b> 0 strokes<br>5 | r <u>e</u> y/min | cm·/1000 strokes<br>7 | rev/min        | Control rod<br>travel<br>mm |  |
| 1150    | 77,5-78,5<br>(76,0-80,0)                   | 1190-1200*  | 600          | 71,0-73,0<br>(69,0-75,0)                    | 100              | 19,5-21,<br>mm RW     | ) -            | -                           |  |

Checking values in brackets

\* 1 mm less control rod travel than col. 2

BOSCH

# Test Specifications Fuel Injection Pumps ① and Governors

WPF 001/4 FOR 6,6 a

1. Edition

PES 6 A 95 D 410 RS 2688

Komb.-Nr. 9 400 085 231

ROV 350-1400 AB 1202 L

supersedes

compationd

engine6,6 L NA

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

#### A. Fuel Injection Pump Settings

Port closing at prestroke 3, 1

3,15-3,25

mm (from BDC)

| Rotational speed<br>rev/min<br>1 | Control rod<br>travel<br>mm<br>2 | Fuel delivery<br>cm <sup>3</sup> /100 strokes<br>3 | Difference<br>cm <sup>3</sup> /<br>100 strokes<br>4 | Control rad<br>travel<br>mm<br>2 | Fuel delivery<br>cm <sup>3</sup> /100 strokes<br>3 | Spring pre-tensioning<br>(torque-control valve)<br>mm<br>6 |
|----------------------------------|----------------------------------|--|---|----------------------------------|--|--|
| 1400                             | 10,1+0,1                         | 7,1-7,3  | 0,35(0,6)   |                                  |  |  |
| 350                              | 6,4-6,5                          | 0,7-1,1  | 0,35(0,55   |                                  |  |  |

Adjust the fuel delivery from each outlet according to the values in

#### **B.** Governor Settings

| Upper rated s         | peed               |                                       | Intermediate | rated sp | eed                           | Lower rated   | speed      |                               | Sliding s | leeve travel       |
|-----------------------|--------------------|---------------------------------------|--------------|----------|-------------------------------|---|------------|-------------------------------|-----------|--------------------|
| deflection of control | rodtravel          | Control rod (18 travel mm rev/min (28 | of control   | rev/min  | Control rod<br>travel<br>mm 4 | Degree of<br>deflection<br>of control<br>lever<br>7 | rev/min    | Control rod<br>travel<br>mm 3 |           | 0                  |
| max.                  | 1430               | 15,2-17,8                             | -            | -        | •                             |   | 100<br>350 | min. 9,0<br>6,4-6,6           |           | 1,8-2,1<br>3,1-3,5 |
| ca. 63                | 9,1<br>4,0<br>1680 | 1440-1450<br>1530-1560<br>0 - 1,0     |              |          |                               |   | 720-7      |                               |           | 5,4-5,7<br>8,5     |
|                       |                    |                                       |              |          |                               | <b>3a</b>   |            |                               |           |                    |

Torque control travel a = " mr

#### C. Settings for Fuel Injection Pump with Fitted Governor

|         |                          | Rotational-speed (2b) firmitation intermediate speed rev/min (4a) | eed high idle speed 50 |                          | idia<br>switchir | ng point                            | Torque-<br>travel | Control rod<br>travel |
|---------|--------------------------|---|------------------------|--------------------------|------------------|-------------------------------------|-------------------|-----------------------|
| rev/min | cm. / 1000 strokes       | 2   | 4                      | cm /1000 \$110 A88       | ,                | 7                                   |                   | 9                     |
| 1400    | 70,5-72,5<br>(68,5-74,5) | 1440-1450*  | 500                    | 50,5-53,5<br>(48,0-56,0) | 100              | 112,0-122,0<br>= 19,0-21,0<br>mm RW | ı                 |                       |

Chucking values in brackets

\* 1 mm less control rod travel than col 2

8.84

# **Test Specifications** Fuel Injection Pumps (1A) and Governors

WPP 001/4 LIE 8,4 a

1. Edition

Komb.-Nr. 0 400 876 322

PES 6 A 95 D 410 RS 2689 RSV 400-1000 A 1 C 2187 L

supersedes Liebherr D 906 NA

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

## A. Fuel Injection Pump Settings

Port closing at prestroke

2,7-2,8 (2,65-2,85)

| Rritational<br>Speed | Control rod | Fuel delivery   | Difference                           | Control rod<br>travel | Fuel delivery   | Spring pre tensioning<br>(torque control valve) |
|----------------------|-------------|-----------------|--------------------------------------|-----------------------|-----------------|---|
| regrann"<br>1        | mm 2        | cm:/100 strokes | cm <sup>-/</sup><br>100 strokes<br>4 | mm<br>2               | cm:/100 strokes | mm<br>6   |
| 1000                 | 9,7-9,8     | 8,1-8,3         | 0,35(0,6)                            |                       |                 |   |
| 400                  | 6,1-6,3     | 1,0-1,6         | 0,35(0,55                            |                       |                 |   |
|                      |             |                 |                                      |                       |                 |   |
|                      |             |                 |                                      |                       | <u>′  </u>      |   |

 $\hat{\mathbb{F}}$  Adjust the fuel delivery from each outlet according to the values in  $oldsymbol{\mathsf{E}}$ 

## **B.** Governor Settings

| 10 1                                  | r rated spend               |                                     | Interme | diate rate | il speed | (4)  |               | rated speed                 | 3 Torque control |                             |  |
|---------------------------------------|-----------------------------|-------------------------------------|---------|------------|----------|--|---------------|-----------------------------|------------------|-----------------------------|--|
| Degree of deflection of control lever | Control rod<br>travel<br>mm | Control rod<br>travet<br>mm revinin |         |            |          | Control<br>lever<br>deflection<br>in degrees | rev/min       | Control rad<br>travel<br>mm | rev/min          | Control rod<br>travel<br>mm |  |
| 1                                     | 2                           | 3                                   | 4       | 5          | 6        | 7  | 8             | 9                           | 10               | 11                          |  |
| 1                                     | 800                         | 0,3-0,7                             | -       | -          | -        | ca.23  | 400           | 5,7                         | 1000             | 9,7-9,8                     |  |
| loose                                 | X =                         | 2,5                                 |         |            |          |  | 400<br>455-51 | 6,1-6,3<br>=2.0             | 550<br>430       | 9,7-9,9<br>10,9-11,5        |  |
| ca. 50                                | 8,7<br>4,0<br>1230          | 1040-1050<br>1065-1095<br>0,3-1,4   | 1       |            |          |  |               |                             |                  |                             |  |

The numbers denote the sequence of the tests

## C. Settings for Fuel Injection Pump with Fitted Governor

| 29      | ill load stop<br>emp 40 C (104 F)  | Rotational speed limitat |              | el delivery<br>aracteristics | Starting f | uel delivery 5          | (4a) Idli    | Control rod       |  |
|---------|------------------------------------|--------------------------|--------------|------------------------------|------------|-------------------------|--------------|-------------------|--|
| rev/min | cm <sup>2</sup> /1000 strokes<br>2 | changed to ) rev/min 3   | rev/min<br>4 | cm·/1000 strokes<br>5        | rev/min    | cm /1000 strokes<br>7   | rev/min<br>8 | trave)<br>mm<br>9 |  |
| 1000    | 81,0-83,0<br>(79,0-85,0)           | 1040-1050*               | 600          | 68,5-71,5<br>(66,0-74,0)     | 100        | 125,0-135<br>(122,0-138 |              | -                 |  |

Checking values in brackets

1 mm less control rod travel than coi. 2



40

WPP 001/4 MB 2,4 d 4. Edition

PES 4 M 55 C 320 RS 60

EP/MN 60 M 46 DR (1) EP/MN 60 M 42 DR (2) EP/MN 60 M 51 DR (3) EP/MN 60 M 43 DR (4) supersede 1.76
company Daimler Benz
engine OM 616
(1/3-PKW)
(2/4-Transporter)

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

#### A. Fuel Injection Pump Settings

Port closing at prestroke

1,70-1,80 (1,65-1,85)

mm (from BDC)

/ max. RW

# Festoil-ISO 4113

| Rotational speed rev/min | Control rod<br>travel<br>mm<br>2 | Fuel delivery<br>cm <sup>3</sup> /100 strokes<br>3 | Difference<br>cm³/<br>100 strokes<br>4 | Control rod<br>travel<br>mm<br>5 | Fuel delivery<br>cm <sup>3</sup> /100 strokes<br>6 | Spring pre-tensioning (torque-control valve) mm 7 |
|--------------------------|----------------------------------|--|--|----------------------------------|--|---|
| 2250                     | 13,7                             | 3,9 - 4,1  | 0,2(0,25)                              |                                  |  |   |
|                          | (+0,1)                           |  |  |                                  |  |   |
| 250<br>1600<br>1000 -    | 9,0-9,2<br>Sect.C,               | 0,4 - 1,0<br>col. 4-6                              | 0,15(0,2)<br>0,25(0,3)                 |                                  |  |   |

Adjust the fuel delivery from each outlet according to the values in

#### **B. Governor Settings**

|   |               |    | timitation |                                | Control    |                           | Auxiliary spring<br>auxiliary cam** |                      | Torque control        |                                |
|---|---------------|----|------------|--------------------------------|------------|---------------------------|-------------------------------------|----------------------|-----------------------|--------------------------------|
| Torque<br>control travel  |               |    |            | Vacuum   Control rod<br>travel |            | Vacuum Control rod travel |                                     | Vacuum               | Control rod<br>travel |                                |
| mm  | mm water col. | s  | mmw.c      | mm                             | mm w c.    | നന                        | mm w.c.                             | mm                   | mm w.c.               | mm                             |
| 1   | 2             | 3  | 4          | 5                              | 6          | 7                         | 8                                   | 9                    | 10                    | 11                             |
| 1,1+0,1   | 500-480       | 10 | 520        | 13,7                           | 580<br>615 | 9,2-13,7<br>6,2-10,7      |                                     | 9,2-10,2<br>7,7- 8,7 | 150<br>250            | 14,8-14, <u>9</u><br>14,4-14,8 |
| ontrol rod travel test (cols. 4-11) rotational speed 500 rev/min. djust breakaway (cols. 4-5) by means of shims* am adjustment (B 8-9 ~ C 7-8) by means of shims* |               |    |            |                                | 675        | 3,2- 7,2                  |                                     |                      | 350<br>520            | 13,9-14,3<br>  13,7-13,8       |

## C. Settings for Fuel Injection Pump with Fitted Governor

|         | stop screw<br>mp 40°C (104° | F)                            | Fuel deliv   | very character            | istics                       | ıdle (stoj<br>idle (imb |                       | Control road travel from full-load to |
|---------|-----------------------------|-------------------------------|--------------|---------------------------|------------------------------|-------------------------|-----------------------|---------------------------------------|
| rev/min | Vacuum<br>mm wat col        | cm <sup>3</sup> /1000 strokes | rev/min<br>4 | Vacuum<br>mm wat col<br>5 | cm³/1000 strokes             | rev/min<br>7            | Vacuum<br>mm wat col. | mm<br>cm³/1000 strokes<br>8           |
| 2250    | 520                         | 39,7 - 40,7<br>(38,7 - 41,1)  |              | 360                       | 38,9 - 40,5<br>(37,9 - 41,5) | 500                     | 600                   | 3,2 - 4,2                             |
|         |                             |                               | 1000         | 140                       | 38,2 - 39,7<br>(37,2 - 40,7) | 250                     | ca. 880               | 4,5 -10,5                             |
|         |                             |                               |              |                           |                              |                         |                       |                                       |

Checking values in brackets

8.77

# Test Specifications Fuel Injection Pumps (A) and Governors

40

WPF (01/4 MB 2.4 t

1. Edition

En

PES 4 M 55 C 320 RS 106 RSV 350 - 1650 MOC 350 Komb.- 0 400 074 079

の大のなの

Sales model 0 400 074 080 supersedes

company
Daimler Benz

engine
0M 616

46 kW

1 - 3 - 4 - 2 = 0 - 90 - 180 - 270 + 0.50 (0.75)
All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke (1,65 - 1,85)

mm (from BDC) RW = 20,0 mm

| Rotational<br>speed | Control rod<br>travel | fuel delivery                | Difference                           | Control rod<br>travel | Fuel delivery   | Spring pre tensioning (torque control valve) |
|---------------------|-----------------------|------------------------------|--------------------------------------|-----------------------|-----------------|--|
| repy fitting        | mm <b>2</b>           | cm <sup>1/1</sup> 00 strokes | cm <sup>-/</sup><br>100 strokes<br>4 | mm<br>2               | cm v100 strokes | mm<br>6                                      |
| 1630                | 13,340,1              | 4,0 - 4,1                    | 0,2 (0,3)                            |                       |                 |  |
| 350                 | 6,1 - 6,              | 8,6 - 0,8                    | 0,1 (0,15                            | )                     |                 |  |
| 750                 | 13,3 + 0,             |                              | 0,25 (0,3                            | )                     |                 |  |
|                     |                       |                              |                                      |                       |                 |  |

Adjust the fuel delivery from each outlet according to the values in

#### **B.** Governor Settings

|        | r rated speed<br>Control rod<br>travel<br>mm |                                   | Intermer<br>4 | hate rater | t spigert | Control lever deflection in degrees |     | rated speed<br>Control rod<br>travet<br>mm | (3) From rev/min | rque control<br>Control rod<br>travel<br>mm |
|--------|--|-----------------------------------|---------------|------------|-----------|-------------------------------------|-----|--|------------------|---|
| loose  | 800  | 0,3- 1,0                          |               |            |           | ca. 40                              | 350 | 6,2  |                  |   |
| ca. 75 | 12,4<br>4,0<br>0,3-1,7                       | =1670-1680<br>=1770-1790<br>=2000 |               |            |           |                                     |     |  |                  |   |

The numbers denote the sequence of the tests\* Adjustment angle = 0° = horizontal control lever position.

#### C. Settings for Fuel Injection Pump with Fitted Governor

| 6    | di Inad Stop<br>Pmp. 40-C (104-F) | 6 Rotational speed limitat | <b>3</b>     | iel delivery<br>paracteristics | Starting fuel delivery 5 |                       |         |                                  |  |  |
|------|-----------------------------------|----------------------------|--------------|--------------------------------|--------------------------|-----------------------|---------|----------------------------------|--|--|
|      | cm 1000 strokes                   | changed to 1 revimin 3     | revimin<br>4 | লেশপ্রেও strokes<br>5          | rev/min                  | cm·/1000 strokes<br>7 | rev/min | Control rod<br>travel<br>mm<br>9 |  |  |
| 1630 | 40,0 - 41,0<br>(39,0 - 42,0)      | 1679-1680 1                | 750          | 36,5 - 38,5<br>(35,5 - 39,5)   | 100<br>350               | min. 53,0             |         |                                  |  |  |

Checking values in brackets

1 mm less control rod travel than col. 2

7.84

**BOSCH** 

# Test Specifications Fuel Injection Pumps (A) and Governors

WPP 001/4 MB 2,4 K 2

2. Edition

En

STIT OSITIONS

PES 4 M 55 C 320 RS 106

RSV 400-2200 MOC 351

supersedes

Daimler-Benz

Komb. 0 400 074 082

0 400 074 081

company

OM 616

 $1-3-4-2 = 0-90-180-270 \pm 0,50 (0,75)$ 

Sales model

engine 53 kW

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

# A. Fuel Injection Pump Settings 1,70-1,80

Port closing at prestroke

(1,65-1,85)

 $_{mm \text{ (from BDC)}} RW = 20,0 \text{ mm}$ 

| Rotational<br>Speed | Control rod | Fuel delivery   | Difference                      | Control rod<br>travel | Fuel delivery   | Spring pre tensioning thorque control valves |
|---------------------|-------------|-----------------|---------------------------------|-----------------------|-----------------|--|
| revernin            | mm (2)      | cm /100 strokes | cm <sup>-/</sup><br>100 strokes | mm<br>2               | cm:/100 strokes | mm<br>6                                      |
| 2180                | 12,9+0,1    | 4,0-4,1         | 0,2(0,3)                        |                       | 3               | Ü  |
| 400                 | 6,4-6,6     | 0,6-0,8         | 0,1(0,15)                       |                       |                 |  |
| 1000                | 13,4+0,1    |                 | 0,25(0,3)                       |                       |                 |  |
|                     |             |                 |                                 |                       |                 |  |

Adjust the fuel delivery from each outlet according to the values in [

#### **B.** Governor Settings

| Degree of                         | rated speed  | Ley/min<br>Control red            | Interm | ediate rate | d speed | (4)<br>Control                         | Lowe    | r rated speed<br> Control rod | 3 10         | rque control<br>Control rort |
|-----------------------------------|--------------|-----------------------------------|--------|-------------|---------|--|---------|-------------------------------|--------------|------------------------------|
| deflection<br>of control<br>lever | travel<br>mm | travel                            | a      | 5           | 6       | lever<br>deflection<br>in degrees<br>7 | rev/min | mm<br>9                       | rev/min      | travel<br>torn               |
| loose                             | 800          | 0,3-1,0                           |        | <u></u>     |         | ca.39                                  | 400     | 6,5                           | 1000<br>1750 | 13,4-13,5<br>13,1-13,4       |
| *ca.70                            |              | 2240-2250<br>2370-2390<br>2= 2550 |        |             |         |  |         |                               |              |                              |

The numbers denote the sequence of the tests Adjustment angle = 0° = horizontal control lever position.

## C. Settings for Fuel Injection Pump with Fitted Governor

| (1)     | off load stop<br>emp. 40 C (104 F) | Rotational speed limitat |              | iet delivery<br>iaracteristics | Starting fuel delivery 5 |  |          | da ide stop |  |  |
|---------|------------------------------------|--------------------------|--------------|--------------------------------|--------------------------|--|----------|-------------|--|--|
| revimin | cm:/1000 strokes                   | rev/min                  | rev/min<br>4 | cm:/1000 strokes               | rev/min                  | cm=1000 strokes<br>7                         | rev miri | mm<br>S     |  |  |
| 2180    | 40,0-41,0<br>(39,0-42,0)           | 2240-2250*               | 1000         | 37,0-38,0<br>(36,0-39,0)       | 1000<br>400              | RW = 20,3<br>min. 53<br>6,0-8,0<br>(5,5-9,0) |          |             |  |  |

Checking values in brackets

\* 1 mm less control rod travel than col. 2

7.84

Festoil-ISO 4113

# **Test Specifications** Fuel Injection Pumps and Governors

WPP 001/4

MWM 8.8 a

4. Edition

PE 6 A 100 0 320 RS 3008

EP/RSV 300-1150 A1B489DR

supersedes 4.84

PE 8 A 100..

RS 3009

A1C489 DR EP/RSV 300-1150 A1B489DR

company engine

MWM D/TD 232 - 6

A1C489 DR RQV 300/550-750 AB 660 R, 871 R

En

D/TD 232 - 8

Instructions P. 3

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

# A. Fuel Injection Pump Settings

Port closing at prestroke

2.0 + 0.1

mm (from BDC)

| Rotational speed | Control rod<br>travel | Fuel delivery                     | Difference<br>cm <sup>3</sup> / | Control rod<br>travel | Fuel delivery  cm <sup>3</sup> /100 strokes | Spring pre-tensioning (torque-control valve) |
|------------------|-----------------------|-----------------------------------|---------------------------------|-----------------------|---|--|
| rev/min          | mm<br>2               | cm <sup>3</sup> /100 strokes<br>3 | 100 strokes                     | mm<br>2               | 3   | 6  |
| 1000             | 9                     | 7,6 - 8,2                         | 0,4                             |                       |   | 4  |
|                  | 6<br>12               | 3,2 - 4,2<br>12,3 - 13,4          |                                 |                       |   |  |
| 200              | 9                     | 3,4 - 4,6                         |                                 |                       |   |  |

Adjust the fuel delivery from each outlet according to the values in

**B.** Governor Settings

| Upper<br>Degree of<br>deflection<br>of control<br>lever | rated speed          | Control rod<br>travel<br>mm | Intermediate Degree of deflection of control lever |      | Control rod<br>travel<br>mm | Degree of deflection of control lever | rated spe<br>rev/min<br>8 | Control rod<br>travel<br>mm |     | que control<br>Control rod<br>travel<br>mm<br>11 |
|---|----------------------|-----------------------------|--|------|-----------------------------|---------------------------------------|---------------------------|-----------------------------|-----|--|
| ca.66   | 1150<br>1200<br>1250 | 16,0<br>11,4<br>5,8         | Without  | auxi | liary spri                  | ca.28<br>ing                          | 300<br>100<br>300<br>350  | 6,0<br>19 - 21<br>5,7-6,3   | 6   |  |
| (5)   | 1230<br>1280<br>1400 | 6,0-9,3<br>1,8-4,0<br>0,3-1 |  |      |                             | ·                                     | 350<br>400<br>500         | 3,5-4,7<br>0,6-3,0<br>0 - 1 | 266 | note   |

The numbers denote the sequence of the tests

# C. Settings for Fuel Injection Pump with Fitted Governor

| 2 Full-loa | d stop                                | 6 Rotational-<br>speed limitat. |         | el delivery<br>tracteristics | Starting<br>Idle | fuel delivery                 | (5a) Idle stop |                |  |
|------------|---------------------------------------|---------------------------------|---------|------------------------------|------------------|-------------------------------|----------------|----------------|--|
|            | 40°C (104°F)<br>cm³/1000 strokes<br>2 | Note changed to . rev/min 3     | rev/min | cm³/1000 strokes<br>5        | rev/min          | cm <sup>3</sup> /1000 strokes | rev/min<br>8   | travel<br>mm   |  |
| Instruc    | tions 4 - 14                          |                                 |         |                              | 100              | 19,5-21,5<br>mm 成             |                |                |  |
|            |                                       |                                 |         |                              |                  |                               |                |                |  |
|            |                                       |                                 |         | <u></u>                      |                  | • 1 mm less c                 |                | travel then so |  |

Checking values in brackets

\* 1 mm less control rod travel than col 2

**B. Governor Settings** 

RQV .. 660R, 871R\*\*

| Upper<br>Degree of<br>deflection<br>of control<br>lever | rated speed                     |   | Intermediate<br>Degree of<br>deflection<br>of control<br>lever | rated spe<br>rev/min<br>5 | ed<br>Control rod<br>travel<br>mm     | Degree of deliection of control lever | rev/min                  | Control rod<br>travel<br>mm              | (3) Tor<br>rev/min<br>10 | control<br>Control rod<br>travel<br>mm |
|---|---------------------------------|---|--|---------------------------|---------------------------------------|---------------------------------------|--------------------------|--|--------------------------|--|
| ca.66   | 750<br>770<br>790<br>800<br>840 | 14,8-17,8<br>9,0-14,0<br>3,5-10,5<br>0 - 8<br>0 | ca.34  | 520<br>600<br>650<br>720  | 13,7-15,5<br>8,5-10,0<br>4,5-7,0<br>0 | ca.10                                 | 300<br>350<br>550<br>630 | 6,8-8,0<br>4,5-7,0<br>3,6-4,0<br>1,8-4,0 |                          |  |

The numbers denote the sequence of the tests

# C. Settings for Fuel Injection Pump with Fitted Governor

| 2 Full load | i stop                                | 6 Rotational-<br>speed limital | fuel delivery characteristics |                                    | Starting<br>Idle | fuel delivery                      | 5a) Idle stop Control rod |                   |
|-------------|---------------------------------------|--------------------------------|-------------------------------|------------------------------------|------------------|------------------------------------|---------------------------|-------------------|
| rev/min     | 40°C (104°F)<br>cm*/1000 strokes<br>2 | Note changed to rev/min        | rev/min                       | cm <sup>1</sup> /1000 strokes<br>5 | rev/min          | cm <sup>3</sup> /1000 strokes<br>7 | revimin<br>8              | travel<br>mm<br>9 |
| Instruct    | tions 4 - 14                          |                                |                               | ·                                  | 100              | 15,7-16,3<br>mm RW                 |                           |                   |
|             |                                       |                                | <b>6</b> a)                   |                                    | 300              | 5,3-5,7<br>mm RW                   |                           |                   |

Checking values in brackets

\* 1 mm less control rod travel than col 2

# **B.** Governor Settings

| 1 Upper<br>Degree of<br>deffection<br>of control<br>lever | rev/min | Control rod<br>travel<br>mm | Intermediate<br>Degree of<br>deflection<br>of control<br>tever | ed<br>Control rod<br>travel<br>mm<br>6 | Degree of deflection of control lever | rated spe<br>rev/min<br>8 | eed<br>Control rod<br>travel<br>mm<br>9 | ~ / | que control<br>Control rod<br>travel<br>mm |
|---|---------|-----------------------------|--|--|---------------------------------------|---------------------------|---|-----|--|
|   |         |                             |  |  |                                       |                           |   |     |  |
| (5)   |         |                             |  |  |                                       |                           |   |     |  |

The numbers denote the sequence of the tests

# C. Settings for Fuel Injection Printing with Fitted Governor

|         | oad stop                                | 6 Rotatical Speed rimitar | Fur cha | el delivery<br>aracteristics | Starting<br>Idle | fuel delivery         | stop<br>Control red |
|---------|---|---------------------------|---------|------------------------------|------------------|-----------------------|---------------------|
| revimin | np. 40°C (104°F)<br>cm³/1000 stru-<br>2 | Note changed to rev/min   | rev/min | cm³/1000 strokes<br>5        | rev/min<br>6     | cm³/1000 strokes<br>7 | travel<br>mm<br>9   |
|         |   |                           |         |                              |                  |                       |                     |
|         |   |                           |         |                              |                  | **                    |                     |
|         |   |                           |         |                              |                  |                       |                     |

\*\* Governor ..871R = electromagnetic starting fuel delivery
unlocking (24 volt)
Switch on magnet for max. 15 sec. when testing.

The nameplate described at  $\underline{\text{MWM 1.5 a}}$  has recently been extended to 2 speeds and 2 deliveries - in column n = (speed) and Q = (full-load delivery) for more accurate setting in the case of governors with torque control.

The following points apply, deviating from WPP 001/4, Supplement 1, setting the governor and the pump:

- (2) Setting according to nameplate n = (speed 1) and Q = (delivery 1); or according to columns 1 and 2
- (3) Is contacted until change of control-rod travel, as read under (2), or (with new nameplate) until the 2 delivery is reached at speed 2; or according to columns 4 and 5
- (6) Is adjusted according to nameplate n = (speed 1 + 20 rpm) or column 3

For repairs on Fendt tractors on which the new nameplate (with 2 speeds and 2 deliveries) has not yet been introduced, the full-load data apply - ordered according to engine types -

## according to the above note

In the case of new replacement pumps from Stuttgart warehouse there is no spring retainer. Send for from MWM according to old nameplate.

Cam sequence and angular spacing:

PE 6 A:

1 - 6 - 3 - 2 - 5 - 4

0 -90 -120-210-240-330°

PE 8 A:

1 - 8 - 5 - 4 - 7 - 2 - 3 - 6 0 -30 -90 -120-180-210-270-300°

| Control | delivery                           | Rotational-speed<br>limitation | Fuel deliv | ery characteristics                | Starting<br>Idle<br>switchir | fuel delivery<br>ng point          | intermed<br>rotationa<br>Torque-<br>travel | speed |
|---------|------------------------------------|--------------------------------|------------|------------------------------------|------------------------------|------------------------------------|--|-------|
| rev/min | cm <sup>3</sup> /1000 strokes<br>2 | rev/min                        | rev/min    | cm <sup>3</sup> /1000 strokes<br>5 | rev/min<br>6                 | cm <sup>3</sup> /1000 strokes<br>7 | rev/min<br>8                               | mm    |
| 165     | PS / 2500 mi                       | n-1                            | •          |                                    |                              | •                                  |  |       |
| 1250    | 81,0-83,0                          | 1270                           | 750        | 82,5 - 85,5                        |                              |                                    |  |       |
| B' 162  | PS / 2500 mi                       | n-1                            |            |                                    |                              |                                    |  |       |
| 250     | 81,0-83,0                          | 1270                           | 750        | 82,5 - 85,5                        |                              |                                    |  |       |
| B 162   | PS / 2500 mi                       | n-1                            |            |                                    |                              |                                    |  |       |
| 1250    | 81,0-83,0                          | 1270                           |            |                                    |                              |                                    |  |       |
| F 160   | PS / 2300 mi                       | n-1                            |            |                                    |                              |                                    |  |       |
| 1.150   | 80,0-82,0                          | 1170                           | 750        | 82,5 - 85,5                        |                              |                                    |  |       |
| B'155   | PS / 2300 mi                       | n-1                            |            |                                    |                              |                                    |  |       |
| 1150    | 80,0-82,0                          | 1170                           | 750        | 82,5 - 85,5                        |                              |                                    |  |       |
| B 155   | PS / 2300 mi                       | in-1                           |            |                                    |                              |                                    |  |       |
| 1150    | 80,0-82,0                          | 1170                           |            |                                    |                              |                                    |  |       |
| A 141   | PS / 2300 mi                       | in-1                           |            |                                    |                              |                                    |  |       |
| 1185    | 76,0-78,0                          | 1200                           |            |                                    |                              |                                    |  |       |
| B'144   | PS / 2100 mi                       | in-1                           |            |                                    |                              |                                    |  |       |
| 1050    | 77,0-79,0                          | 1060                           | 750        | 82,5 - 85,5                        |                              |                                    |  |       |
| B 144   | PS / 2100 mi                       | in-1                           |            |                                    |                              |                                    |  |       |
| 1050    | 77,0-79,0                          | 1060                           |            |                                    |                              |                                    |  |       |
| A 131   | PS / 2100 m                        | in-1                           |            |                                    |                              | <del></del>                        | <del></del>                                |       |
| 1080    | 73,0-75,0                          | 1090                           |            |                                    |                              |                                    |  |       |
| F 144   |                                    | in-1                           |            |                                    |                              |                                    |  |       |
| 1000    | 77,0-79,0                          | 1010                           | 750        | 82,5 - 85,5                        |                              |                                    |  |       |
| B'138   | PS / 2000 m                        | in <sup>-1</sup>               |            |                                    |                              |                                    |  | .,    |
| 1000    | 77.0-79,0                          | 1010                           | 750        | 82,5 - 85,5                        |                              |                                    |  |       |

| engine power Full-load delivery Control-rod stop Test oil temp 40°C (104°F) | Rotational-speed<br>limitation | Fuel delin | very characteristics          | Starting<br>Idle<br>switchin | fuel delivery                 | Intermed<br>rotationa<br>Torque-t | speed |
|---|--------------------------------|------------|-------------------------------|------------------------------|-------------------------------|-----------------------------------|-------|
| rev/min cm³/1000 strokes  | rev/min                        | rev/min    | cm <sup>3</sup> /1000 strokes | rev/min                      | cm <sup>3</sup> /1000 strokes | rev/min                           | mm    |
|   | 3                              | 4          | 5                             | 6                            | 7                             | 8                                 |       |
| 3 138 PS / 2000 min   | -1                             | '          | •                             | •                            | •                             |                                   |       |
| 77,0-79,0   | 1010                           |            |                               |                              |                               |                                   |       |
| A 126 PS / 2000 min   | -1                             |            |                               |                              |                               |                                   |       |
| 1030 73,0-75,0  | 1040                           |            |                               |                              |                               |                                   |       |
| 3 127 PS / 1800 min   | -1                             |            |                               |                              |                               |                                   |       |
| 900 78,0-80,0   | 910                            |            |                               |                              |                               |                                   |       |
| A'115 PS / 1800 min   | -1                             |            |                               |                              |                               |                                   |       |
| 900 78,0-80,0   | 910                            |            |                               |                              |                               |                                   |       |
| A 115 PS / 1800 min   | -1                             |            |                               |                              |                               |                                   |       |
| 930 74,0-76,0   | 940                            |            |                               |                              |                               |                                   |       |
| B 108 PS / 1500 min   | -1                             |            |                               |                              |                               |                                   |       |
| 750 80,0-82,0   | 760                            |            |                               |                              |                               |                                   |       |
| A' 98 PS / 1500 min   | -1                             |            |                               |                              |                               |                                   |       |
| 750 80,0-32,0   | 760                            |            |                               |                              |                               |                                   |       |
| A 98 PS / 1500 min  | 1                              |            |                               |                              |                               |                                   |       |
| 775 76,0-78,0   | 785                            |            |                               |                              |                               |                                   |       |

B 162 PS / 2300 min-1

1150 83,0-85,0 Special output 1170

D 143 PS / 1800 min-1 900 89,0-91,0 Emergency power output

910

C 130 PS / 1800 min-1

900 89,0-91,0 Emergency power output 910

| engine por<br>Full-load de<br>Control-roo<br>Test oil terr | elivery                       | Rotational speed limitation | Fuel deliv | ,                             | Starting<br>Idle<br>switchin | fuel delivery                 | Intermedi<br>rotational<br>Torque-c<br>travel | speed |
|--|-------------------------------|-----------------------------|------------|-------------------------------|------------------------------|-------------------------------|---|-------|
| rev/min  | cm <sup>3</sup> /1000 strokes | rev/min                     | rev/min    | cm <sup>3</sup> /1000 strokes | rev/min                      | cm <sup>3</sup> /1000 strokes | rev/min                                       | mπ    |
| 1  | 2                             | 3                           | 4          | 5                             | 6                            | 7                             | 8   |       |

D 120 PS / 1500 min<sup>-1</sup>

750 90,0-92,0 760

Emergency power output

C 109 PS / 1500 min<sup>-1</sup>

750 90,0-92,0 760

Emergency power output

| rev/min cm³/1000 strokes rev/min rev/min cm³/1000 str | travel   |
|---|--|
| 1 2 3 4 5   | okes rev/min cm³/1000 strokes rev/min mm 6 7 8 |
| F 220 PS / 2500 min <sup>-1</sup>                     | •  |
| 1250 81,C-83,0 1270 750 82,5 -                        | 85,5   |
| B'216 PS / 2500 min <sup>-1</sup>                     |  |
| 1250 81,0-83,0 1270 750 82,5 -                        | 85,5   |
| 3 216 PS / 2500 min-1                                 |  |
| 1250 81,0-83,0 1270                                   |  |
| F 213 PS / 2300 min-1                                 |  |
| 1.150 80,0-82,0 1170 750 82,5 -                       | 85,5   |
| B'206 PS / 2300 min <sup>-1</sup>                     |  |
| 1150 80,0-82,0 1170 750 82,5 -                        | 85,5   |
| B 206 PS / 2300 min-1                                 |  |
| 1150 80,0-82,0 1170                                   |  |
| A 188 PS / 2300 min <sup>-1</sup>                     |  |
| 1185 76,0-78,0 1200                                   |  |
| B'192 PS / 2100 min <sup>-1</sup>                     |  |
| 1050 77,0-79,0 1060 750 82,5-8                        | 5,5  |
| B 192 PS / 2100 min <sup>-1</sup>                     |  |
| 1050 77,0-79,0 1060                                   |  |
| A 175 PS / 2100 min <sup>-1</sup>                     |  |
| 1080 73,0-75,0 1090                                   |  |
| F 192 PS / 2000 min <sup>-1</sup>                     |  |
| 1030 77,0-79,0 1040 750 82,5 -                        | 85,5   |
| 3'184 PS / 2000 min-1                                 | ر در در در در در در در در در در در در در       |
| 000 77,0-79,0 1010 750 82,5 -                         | 85,5   |

Checking values in brackets

\* 1 mm less control rod travel than col. 2

Testcil-ISO 4113

# C. Settings for Fuel Injection Pump with Fitted Governor

| engine po<br>Full-load di<br>Control-roi<br>Test oil ten | elivery                       | Rotational-speed limitation | Fuel deliv |                               | Starting<br>Idle<br>switchin |                               | intermedi<br>rotational<br>Torque-c<br>travel | speed    |
|--|-------------------------------|-----------------------------|------------|-------------------------------|------------------------------|-------------------------------|---|----------|
| rev/min  | cm <sup>3</sup> /1000 strokes | rev/min                     | rev/min    | cm <sup>3</sup> /1000 strokes | rev/min                      | cm <sup>3</sup> /1000 strokes | ten/wiu                                       | mm       |
| 1  | 2                             | 3                           | 4          | 5                             | 6                            | 7                             | 18  | <b> </b> |

| [1     | 2              | [3          |      | 4 | 3                                     | <u> </u> |   |   | <del></del> | ļ |
|--------|----------------|-------------|------|---|---------------------------------------|----------|---|---|-------------|---|
|        |                | 1           |      | 1 | •                                     | •        | ı | • | •           |   |
| B 184  | PS / 2000 mi   | <u>n-1</u>  |      |   |                                       |          |   |   |             |   |
| 1000   | 77,0-79,0      |             | 1010 |   |                                       |          |   |   |             | _ |
| A 168  | PS / 2000 mi   | n-1         |      |   |                                       |          |   |   |             |   |
| 1000   | 73,0-75,0      | -           | 1010 |   |                                       |          |   |   |             |   |
| 1000   | 75,0 75,0      |             |      |   |                                       |          |   |   |             |   |
| B 169  | PS / 1800 mi   | n-1         |      |   |                                       |          |   |   |             |   |
| 930    | 78,0-80,0      |             | 940  |   |                                       |          |   |   |             |   |
|        |                |             |      |   |                                       |          |   |   |             | - |
| A '154 | PS / 1800 m    | in-1        |      |   |                                       |          |   |   |             |   |
| 900    | 78,0-80,0      |             | 910  |   |                                       |          |   |   |             |   |
|        | 70,0 00,0      |             |      |   | · · · · · · · · · · · · · · · · · · · |          |   |   |             | _ |
| A 154  | PS / 1800 mi   | n-1         |      |   |                                       |          |   |   |             |   |
| 900    | 74,0-76,0      |             | 910  |   |                                       |          |   |   |             |   |
|        |                |             |      |   |                                       |          |   |   |             | _ |
| B 144  | PS / 1500 mi   | n-1         |      |   |                                       |          |   |   |             |   |
| 775    | 80,0-82,0      |             | 785  |   |                                       |          |   |   |             |   |
|        |                |             |      |   |                                       |          |   |   |             |   |
| A'130  | PS / 1500 mi   | n-1         |      |   |                                       |          |   |   |             |   |
| 750    | 80,0-82,0      |             | 760  |   |                                       |          |   |   |             |   |
|        |                |             |      |   |                                       |          |   |   |             |   |
| A 130  | PS / 1500 mi   | n-1         |      |   |                                       |          |   |   |             |   |
| 750    | 76,0-78,0      |             | 760  |   |                                       |          |   |   |             |   |
|        |                |             |      |   |                                       |          |   |   | <del></del> |   |
| B 216  | PS / 2300 mi   | n-1         |      |   |                                       |          |   |   |             |   |
| 1150   | 83,0-85,0      |             | 1170 |   |                                       |          |   |   |             |   |
| Specia | 1 output       |             |      |   |                                       |          |   |   |             |   |
| D 190  | PS / 1800 mi   | in-1        |      |   |                                       |          |   |   |             |   |
| 900    | 89,0-91,0      |             | 910  |   |                                       |          |   |   |             |   |
|        | ncy power out  | out         | 310  |   |                                       |          |   |   |             |   |
|        |                |             |      |   |                                       |          |   |   |             |   |
| C 173  | PS / 1800 mi   | <u>in-1</u> |      |   |                                       |          | 4 |   |             |   |
| 900    | 89,0-91,0      |             | 910  |   |                                       |          |   |   |             |   |
| Emerge | ncy power outp | out         |      |   |                                       |          |   |   |             |   |

-9-

# C. Settings for Fuel Injection Pump with Fitted Governor

| engine po<br>Full-load di<br>Control-roo<br>Test oil terr | elivery                       | Rotational-speed<br>limitation | Fuel deliv | very characteristics          | Starting<br>Idle<br>switchin | fuel delivery                 | Intermedi<br>rotational<br>Torque-c<br>travel | speed |
|---|-------------------------------|--------------------------------|------------|-------------------------------|------------------------------|-------------------------------|---|-------|
| rev/min   | cm <sup>3</sup> /1000 strokes | rev/min                        | rev/min    | cm <sup>3</sup> /1000 strokes | rev/min                      | cm <sup>3</sup> /1000 strokes |   | mm    |

D 160 PS / 1500 min<sup>-1</sup>

760

750 90,0-92,0 Emergency power output

C 145 PS / 1500 min<sup>-1</sup>

760

90,0-92,0 Emergency power output

750

| engine power<br>Full-load delivery<br>Control-rod stop<br>Test oil temp 40°C (104°F) |                               | Rotational-speed<br>limitation | Fuel delivery characteristics |                               | Starting fuel delivery ldle switching point |                               | Intermediate rotational speed Torque-control travel |      |
|--|-------------------------------|--------------------------------|-------------------------------|-------------------------------|---|-------------------------------|---|------|
| rev/min  | cm <sup>3</sup> /1000 strokes | rev/min                        | rev/min                       | cm <sup>3</sup> /1000 strokes | rev/min                                     | cm <sup>3</sup> /1000 strokes | 1   | l mm |
| 1  | 2                             | 3                              | 4                             | 5                             | 6   | 7                             | 8   |      |

F 210 PS / 2300 min<sup>-1</sup>

800 104,5-107,5 105,0-107,0 1170 1150

2300 min<sup>-1</sup> B' 207 PS /

1150 105,0-107,0 1170 800 104,5-107,5

B 207 PS / 2300 min<sup>-1</sup>

105,0-107,0 1150 1170

A 188 PS / 2300 min-1

101,0-103,0 1185

1200

B'192 PS / 2100 min<sup>-1</sup>

103,0-105,0 800 105,5-107,5 1050 1060

B 192 PS / 2100 min<sup>-1</sup>

103,0-105,0 1050 1060

A 174 PS / 2100 min-1

99,0-101,0 1080 1090

F 192 PS / 2000 min-1

102,0-104,0 1000 800 104,5-107,5 1010

B'184 PS / 2000 min<sup>-1</sup>

102,0-104,0 1000 800 104,5-107,5 1010

 $/ 2000 \, \text{min}^{-1}$ B 184 PS

1000 102,0-104,0 1010

A 167 PS / 2000 min<sup>-1</sup>

1030 98,0-100,0 1040

B 168 PS / 1800 min<sup>-1</sup>

900 101,0-103,0 910

Checking values in brackets

# Testoil-ISO 4113

# C. Settings for Fuel Injection Pump with Fitted Governor

| engine por<br>Full-load de<br>Control-roo<br>Test oil terr | elivery                       | Rotational-speed limitation | Fuel deli | very characteristics          | Starting<br>Idle<br>switchin |                               | intermed<br>rotational<br>Torque-c<br>travel | speed |
|--|-------------------------------|-----------------------------|-----------|-------------------------------|------------------------------|-------------------------------|--|-------|
| rev/min  | cm <sup>3</sup> /1000 strokes | rev/min                     | rev/min   | cm <sup>3</sup> /1000 strokes | rev/min                      | cm <sup>3</sup> /1000 strokes |  | mm    |
| 1  | 2                             | 3                           | 4         | 5                             | 6                            | 7                             | 8  |       |

| A. | 153 | PS | <br>1800 | min-1 |     |
|----|-----|----|----------|-------|-----|
|    |     |    | 103,0    |       | 910 |

| A 153 | PS / 1800 min-1 |     |
|-------|-----------------|-----|
| 930   | 97,0-99,0       | 940 |

| B 142 | PS / 1500 min <sup>-1</sup> |     |
|-------|-----------------------------|-----|
| 750   | 100,0-102,0                 | 76n |

| A'129 | PS / 1500 min <sup>-1</sup> |     |
|-------|-----------------------------|-----|
| 750   | 100,0-102,0                 | 760 |
|       |                             |     |

| A 129 | PS | / 1500 min <sup>-1</sup> |     |
|-------|----|--------------------------|-----|
| 775   | 96 | ,0-98,0                  | 785 |

①

# C. Settings for Fuel Injection Pump with Fitted Governor

| engine p<br>Full-load<br>Control-re<br>Test oil te | delivery                      | Rotational-speed<br>limitation | Fuel deliv | very characteristics               | Starting<br>Idle<br>switchir | fuel delivery                         | Intermed<br>rotationa<br>Torque-o<br>travel | speed |
|--|-------------------------------|--------------------------------|------------|------------------------------------|------------------------------|---------------------------------------|---|-------|
| rev/min  | cm <sup>3</sup> /1000 strokes | rev/min                        | rev/min    | cm <sup>3</sup> /1000 strokes<br>5 | rev/min                      | cm <sup>3</sup> /1000 strokes         |   | mm    |
|  |                               | in-1                           | 7          |                                    | •                            | •                                     | •   |       |
| F 292<br>1250                                      | 102,0-104,0                   | 1270                           | 800        | 100,5-103,5                        |                              |                                       |   |       |
| B'292  | PS / 2500 m                   | in-1                           |            |                                    |                              |                                       | •   |       |
| 1250   | 102,0-104,0                   | 1270                           | 800        | 100,5-103,5                        |                              |                                       |   |       |
| B 292  | PS / 2500 m                   | in-1                           |            |                                    |                              |                                       |   |       |
| 1250   | 102,0-104,0                   | 1270                           |            |                                    |                              |                                       |   |       |
| F 280  | PS / 2300 m                   | in-1                           |            |                                    |                              | · · · · · · · · · · · · · · · · · · · |   |       |
| 1150   | 100,0-102,0                   | 1170                           | 800        | 100,5-103,5                        |                              |                                       |   |       |
| B'275  | PS / 2300 m                   | in-1                           |            |                                    |                              |                                       |   |       |
| 1150   | 100,0-102,0                   | 1170                           | 800        | 100,5-103,5                        |                              |                                       |   |       |
| B 275  | PS / 2300 m                   | in-1                           |            |                                    |                              |                                       |   |       |
| 1150   | 100,0-102,0                   | 1170                           |            |                                    |                              |                                       |   |       |
| A 250  | PS / 2300 m                   | in-1                           |            |                                    |                              |                                       | -   |       |
| 1185   | 96,0-98,0                     | 1200                           |            |                                    |                              |                                       |   |       |
| B'255  | PS / 2100 m                   | in-1                           |            |                                    |                              |                                       |   |       |
| 1050   | 99,0-101,0                    | 1060                           | 800        | 100,5-103,5                        |                              |                                       |   |       |
| B 255  |                               |                                |            | ;                                  |                              |                                       |   |       |
| 1050   | 99,0-101,0                    | 1060                           |            |                                    |                              |                                       |   |       |
| A 232  |                               |                                |            |                                    |                              |                                       |   |       |
| 1080   | 95,0-97,0                     | 1060                           |            |                                    |                              |                                       |   |       |
| F 25 <u>6</u>                                      |                               |                                |            |                                    |                              | -                                     |   |       |
| 1000   | 99,0-101,0                    | 1010                           | 800        | 100,5-103,5                        |                              |                                       |   |       |
| B'245  |                               |                                |            |                                    |                              |                                       | ,   |       |
| 1000   | 99,0-101,0                    | 1010                           | 800        | 100,5-103,5                        |                              |                                       |   |       |

910

| engine po<br>Full-toad d<br>Control-roi<br>Test oil ten | elivery                       | Rotational-speed timitation | Fuel deta | very characteristics          | Starting<br>Idle<br>switchir | fuel delivery                 | Intermed<br>rotational<br>Torque-c<br>travel | speed |
|---|-------------------------------|-----------------------------|-----------|-------------------------------|------------------------------|-------------------------------|--|-------|
| rev/min   | cm <sup>3</sup> /1000 strokes | rev/min                     | rev/min   | cm <sup>9</sup> /1000 strokes | rev/min                      | cm <sup>3</sup> /1000 strokes |  | mm    |
| <del> </del>  |                               | <del> </del>                | +         |                               | +                            |                               | 1  | T     |

| B 245 | PS /  | 2000 | min-1 |      |
|-------|-------|------|-------|------|
|       | 99,0- |      |       | 1010 |

| A 222 | PS /   | 2000 | min-1 |      |
|-------|--------|------|-------|------|
|       | 95.0-9 |      |       | 1040 |

| B 224 | PS  | /   | 1800 | min-1 |     |
|-------|-----|-----|------|-------|-----|
| 900   | 99, | 0-1 | 01,0 |       | 910 |

| A'203 | PS  | /   | 1800  | min-1 |
|-------|-----|-----|-------|-------|
| . 900 | 99. | 0-1 | 101.0 |       |

| A'172 | PS | / | 1500 | min-1 |
|-------|----|---|------|-------|
|       |    |   |      |       |

| A | 172 | PS | / | 1500 | min-1 |
|---|-----|----|---|------|-------|
|   |     |    |   |      |       |

| D | 250 | PS | / | 1800 | min-1 |
|---|-----|----|---|------|-------|
| _ |     |    | • |      |       |

| 900    | 111,0-113,0       | 910 |
|--------|-------------------|-----|
| Emerge | ency power output |     |

| С | 227 | PS | /        | 1800 min <sup>-1</sup> |
|---|-----|----|----------|------------------------|
| _ |     |    | <u> </u> |                        |

| 900    | 111  | ,0-113, | ,0     |
|--------|------|---------|--------|
| Emerge | ency | power   | output |

| D | 210 | PS | 1 | 1500 | min-1 |
|---|-----|----|---|------|-------|
|   |     |    |   |      |       |

760

910

Checking values in brackets

| Full | gine pov<br>l·load de<br>ntrol·rod | Hivery                        | Rotational-speed<br>limitation | Fuel deliv |                               | Starting<br>Idle<br>switchin | luet delivery                 | intermedi<br>rotational<br>Torque-d<br>travel | speed |
|------|------------------------------------|-------------------------------|--------------------------------|------------|-------------------------------|------------------------------|-------------------------------|---|-------|
| rev  | /min                               | cm <sup>3</sup> /1000 strokes | rev/min                        | rev/min    | cm <sup>3</sup> /1000 strokes | rev/min                      | cm <sup>3</sup> /1000 strokes | rev/min                                       | mm    |

C 191 PS / 1500 min<sup>-1</sup>
750 111,0-113,0 760

Testoil-ISO 4113

# Test Specifications Fuel Injection Pumps (A) and Governors

40

WPP 001/4 MB 2,4 u

1. Edition

En

Testoil-ISO 4113

PES 4 M 55 C 32U RS 106-1

RSV 350-1650 MOC 350

Komb. 0 400 074 083

Sales model

0 400 074 084

company Daimler Benz

OM 616 46 kW

 $1-3-4-2=0-90-180-270 \pm 0,50 (0,75)$ 

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

## A. Fuel Injection Pump Settings

Port closing at prestroke

(1,65-1,85)

mm (from BDORW=20,0 mm

| Rotational speed | Control rod<br>travel | Fuel delivery .              | Difference                      | Control rod<br>travel | Fuel delivery     | Spring pre tensioning (forque-control valve) |
|------------------|-----------------------|------------------------------|---------------------------------|-----------------------|-------------------|--|
| rey/min          | nım (2)               | cm <sup>1</sup> /100 strokes | cm <sup>-/</sup><br>100 strokes | m:m                   | cm // 100 strokes | mm   |
| 1                | 2                     | 3                            | 4                               | 2                     | 3                 | 6  |
| 1630             | 12,5+0,1              | 3,7-3,8                      | 0,2(0,3)                        |                       |                   |  |
| 35 <b>0</b>      | 6,1-6,3               | 0,6-0,8                      | 0,1(0,15)                       |                       |                   |  |
| 750              | 12,4+0,1              |                              | 0,25(0,3)                       |                       |                   |  |
|                  |                       |                              |                                 |                       |                   |  |

Adjust the fuel delivery from each outlet according to the values in

#### **B.** Governor Settings

|    | 100000 01 | rated speed<br>Control rod<br>travel<br>mm | rev/min<br>Control rod<br>travel<br>mm rev/min<br>3 | Intermed | ate rated | speed | Control-<br>lever<br>deflection<br>in degrees<br>7 |     | rated speed<br>Control rod<br>travel<br>mm | rev/min | que control<br>Control rod<br>travel<br>mm |
|----|-----------|--|---|----------|-----------|-------|--|-----|--|---------|--|
|    | loose     | 800  | 0,3-1,0   |          |           |       | ca. 40   | 350 | 6.2  |         | ļ  |
| -1 | ca.76     | 11,5<br>4,0<br>0,3-1,7                     | 1670-1680<br>1745-1775<br>2000                      |          |           |       |  |     |  |         |  |

The numbers denote the sequence of the test Adjustment angle = 0° = horizontal control lever position.

# C. Settings for Fuel Injection Pump with Fitted Governor

|                             | II load stop                                  | 6 Rotational speed limital           | 30 F.   | iel delivery<br>paracteristics     | Starting f | Starting fuel delivery 5 |              | 4a) Idle stop     |  |
|-----------------------------|---|--------------------------------------|---------|------------------------------------|------------|--------------------------|--------------|-------------------|--|
| Test oil to<br>revimin<br>1 | emp. 40. C (104. F1<br>cm //1000 strokes<br>2 | Note<br>changed to 1<br>rev/min<br>3 | rev/min | cm <sup>-/</sup> 1000 strokes<br>5 | rev/min    | cm //1000 strokes<br>7   | rev/min<br>8 | travel<br>mm<br>9 |  |
| 1630                        | 37,0-38,0<br>(36,0-39,0)                      | 1670~1680*                           | 750     | 33,5-34,5<br>(32,5-35,5)           | 100        | RW=20,3<br>min.53,0      |              |                   |  |

Checking values in brackets

\* 1 mm less control rod travel than col 2

**BOSCH** 

Geschaftsbereich KH. Kundendienst. Ktz-Ausrustung. 1980 by Robert Bosch GmbH. Postfach 50. D-7000 Stuttgart 1. Printed in the Federal Republic of Germany tmprime en Republique Fédérale d'Allemagne par Robert Bosch GmbH.

# **Test Specifications** Fuel Injection Pumps (1A) and Governors

WPP 001/4 MB 2,4 u1 1. Edition

supersedes \_

En

PES 4 M 55 C 320 RS 106-1 RSV 400-2200 MOC 351

Komb. 0 400 074 086

company Daimler Benz OM 616 engine

 $1-3-4-2=0-90-180-270 \pm 0.50 (0.75)$ 

53 kW

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

1,70-1,80 Port closing at prestroke (1,65-1,85)

mm (from BDC) RW 20.0 mm

Sales model 0 400 074 085

| Rotational<br>speed<br>rev/min | Control rod travel mm 2 | Fuel delivery<br>cm <sup>2</sup> /100 strokes<br>3 | Difference<br>cm³/<br>100 strokes<br>4 | Control rod<br>travel<br>mm<br>2 | Fuel delivery  cm³/100 strokes 3 | Spring pre-tensioning<br>(torque-control valve)<br>mm |
|--------------------------------|-------------------------|--|--|----------------------------------|----------------------------------|---|
| 2180                           | 11,9+0,1                | 3,55-3,65  | 0,2(0,3)                               |                                  |                                  |   |
| 400<br>1550                    | 6,4-6,6<br>12,5+0,1     | 0,6-0,8  | 0,1(1,5)<br>0,25(0,3)                  |                                  |                                  |   |

Adjust the fuel delivery from each outlet according to the values in

#### **B. Governor Settings**

| (1) Uppe                                       | er rated speed              |  | Intermediate rated speed |   |   | Lower rated speed                                  |              |                             | (3) To       | orque control               |
|--|-----------------------------|--|--------------------------|---|---|--|--------------|-----------------------------|--------------|-----------------------------|
| Degree of<br>deflection<br>of control<br>lever | Control rod<br>travel<br>mm | Control rod<br>travel<br>mm rev/min<br>3 | 4                        | 5 | 6 | Control-<br>lever<br>deflection<br>in degrees<br>7 | rev/min<br>8 | Control rod<br>travel<br>mm | rev/min      | Control rod<br>travel<br>mm |
| loose  | 800                         | 0,3-1,0                                  |                          |   |   | ca. 40   | 400          | 6,5                         | 1550<br>1750 | 12,5+0,1<br>12,1+0,2        |
| ca.72  | 4,0 =                       | 2240-2250<br>2355-2385<br>7= 2550        |                          |   |   |  | ·            |                             | 1950         | 11,9+0,2                    |

The numbers denote the sequence of the test  $^*$  Adjustment angle = 0° horizontal control lever position.

#### C. Settings for Fuel Injection Pump with Fitted Governor

| 9                           | ill-load stop                             | Rotational-<br>speed limitat          | 39 Fu   | iel delivery<br>paracteristics     | Starting f | Starting fuel delivery 5      |         | 4a) Idle stop               |  |
|-----------------------------|---|---------------------------------------|---------|------------------------------------|------------|-------------------------------|---------|-----------------------------|--|
| Test oil te<br>rev/min<br>1 | emp 40°C (104°F)<br>cm3/1000 strokes<br>2 | Note.<br>changed to )<br>rev/min<br>3 | rev/min | cm <sup>9</sup> /1000 strokes<br>5 | rev/mic    | cm <sup>3</sup> /1000 strokes | rev/min | Control rod<br>travel<br>mm |  |
| 2180                        | 35,5-36,5<br>(34,5-37,5)                  | 2240-2250*                            | 1550    | 36,0-37,0<br>(35,0-38,0)           | 100        | RW=20,3<br>min. 53,0          |         |                             |  |
|                             |   |                                       |         | ٠                                  | 400        | 6,0-8,0<br>(5,5-9,0)          |         |                             |  |
|                             |   |                                       | _ #     |                                    |            |                               |         |                             |  |

Checking values in brackets

\* 1 mm less control rod travel than col. 2

7.84

L16

Geschaftsbereich KH. Kundendienst. Kfz-Ausrustung. \$\footnote{c}\$ 1980 by Robert Bosch GmbH. Postfach 50. D-7000 Stuttgart 1. Printed in the Federal Republic of Germany Imprime en République Fedérale d'Allemagne par Robert Bosch GmbH.

# Test Specifications Fuel Injection Pumps (A) and Governors

40

WPP 001/4 MB 3,0 V

2. Edition

PES 5 M 55 C 320 RS 109-1

RSV 350-1650 MOC 350-1

supersedel.84
Daimler-Benz

Komb.-Nr. 0 400 075 007

0 400 075 008 Sales model

company OM 617 engine 57 kW

1-2-4-5-3

Port closing at prestroke

5.13

 $0-72-144-216-288 \pm 0.50 (0.75)$ 

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

# A. Fuel Injection Pump Settings

2,20-2,30 (2,15-2,35)

mm (from BDORW = 20,0 mm

| Control rod<br>travel<br>mm 2 | Fuel delivery cm*/100 strokes | Difference<br>cm·/<br>100 strokes<br>4                       | Control rod<br>travel<br>mm  | Fuel delivery<br>cm <sup>-</sup> /100 strokes<br>3  | Spring pre tensioning storque-control valve) mm 6                                       |
|-------------------------------|-------------------------------|--|--|---|---|
| 12,5+0,1                      | 3,7-3,8                       | 0,2(0,3)   |  |   |   |
| 6,2-6,5                       | 0,6-0,8                       | 0,1(0,15)  |  |   |   |
| 13,2+0,1                      |                               | 0,25(0,3)  |  |   |   |
|                               |                               |  |  |   |   |
|                               | mm 2<br>12,5+0,1<br>6,2-6,5   | travel mm 2 cm/100 strokes  12,5+0,1 3,7-3,8 6,2-6,5 0,6-0,8 | travel mm 2 cm <sup>1</sup> /100 strokes 12,5+0,1 3,7-3,8 0,2(0,3) 6,2-6,5 0,6-0,8 0,1(0,15) | travel mm 2 cm'/100 strokes 100 strokes 4  12,5+0,1  3,7-3,8  0,2(0,3)  6,2-6,5  0,6-0,8  0,1(0,15) | travel mm 2 cm*/100 strokes 3  12,5+0,1  3,7-3,8  0,2(0,3)  6,2-6,5  0,6-0,8  0,1(0,15) |

Adjust the fuel delivery from each outlet according to the values in

# **B.** Governor Settings

| 11 1    | rated speed<br>Control rod<br>travel<br>mm | rev/min<br>Control rod<br>travel<br>mm rev/min | Intern | nediate rate | ed speed | Control-<br>lever<br>deflection<br>in degrees<br>7 |        | rated speed<br>Control rod<br>travel<br>mm | 1131                 | rque control<br>Control rod<br>travel<br>mm |
|---------|--|--|--------|--------------|----------|--|--------|--|----------------------|---|
| loose   | 800  | 0,3-1,0  |        |              |          | ca. 40   | 350    | 6,2-6,5                                    | 1150<br>1400<br>1630 | 13,2-13,3<br>12,6-12,8<br>12,5-12,6         |
| *ca.75° | 1770-1                                     | 680 = 11,6<br>800 = 4,0<br>0,3-1,7             |        |              |          | * Se   | idle a | xiliary s                                  | pring                | at 2,0 mm.                                  |

The numbers denote the sequence of the tests

\* Adjustment angle = 0° = horizontal control lever positi

# C. Settings for Fuel Injection Pump with Fitted Governor

|         | ull load stop                                  | Rotational speed limitat |         |                                | Starting f   | uel delivery 5                    | da Idle stop |                   |
|---------|--|--------------------------|---------|--------------------------------|--------------|-----------------------------------|--------------|-------------------|
| rev/min | emp. 40. C. (104. F)<br>cm://1000 strokes<br>2 | changed to 1 rev/min     | rev/min | cm <sup>-/</sup> /1000 strokes | rev/min<br>6 | cm·/1000 strokes<br>7             | rev/min      | travel<br>mm<br>9 |
| 1630    | 37,0-38,0<br>(36,0-39,0)                       | 1670-1680*               | 750     | 36,5-37,5<br>(35,5-38,5)       | 100<br>350   | min. 53,0<br>6,0-8,0<br>(5,5-9,0) |              |                   |

Checking values in brackets

\* timm less control rod travel than col. 2

8.84

BOSCH

Geschaftsbereich KM-Kundendienst-Kfz-Ausrustung 1980 by Robert Bosch GmbH-Postfach 50-D-7000 Stuftgart 1-Printed in the Federal Republic of Germany Imprime en Republique Federale d'Allemagne par Robert Bosch GmbH

# Test Specifications Fuel Injection Pumps (A) and Governors

40

WPP 001/4 VOL 6,0 t

1. Edition

Εn

PES 6 MW 100/320 RS 1004 RSV 325-1050 MW 4/308-1 0 403 476 020

supersedrs company TD 60 D engine 112 kW

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

# A. Fuel Injection Pump Settings

Port closing at prestroke

2,80-2,90 (2,75-2,95)

mm (from BDC) bei RW=9,0-12,0 mm

| Rotational speed | Control rod | Fuel delivery   | Difference                           | Control rod<br>travel | Fuel delivery   | Spring pre tensioning (torque control valve) |
|------------------|-------------|-----------------|--------------------------------------|-----------------------|-----------------|--|
| rev/min          | mm 2.       | cm1/100 strokes | cm <sup>-/</sup><br>100 strokes<br>4 | mm<br>2               | cm v100 strokes | mm<br>6                                      |
| 1020             | 10,8+0,1    | 8,65-8,85       | 0,35(0,6)                            |                       |                 |  |
| 325              | 4,9-5,0     | 1,0-1,4         | 0,35(0,55                            | )                     |                 |  |
|                  | <u> </u>    |                 |                                      |                       |                 |  |
|                  |             |                 |                                      |                       |                 |  |

Adjust the fuel delivery from each outlet according to the values in

#### **B.** Governor Settings

|        | r rated speed<br>Control rad<br>travel<br>mm |                                  | Intermed | diate rated | speed | Control-<br>lever<br>deflection<br>in degrees<br>7 | Lower<br>rev/min<br>8 | rated speed<br>Controt rod<br>travel<br>mm | 3 To               | rque control<br> Control rod<br> travel<br> mm<br>  11 |
|--------|--|----------------------------------|----------|-------------|-------|--|-----------------------|--|--------------------|--|
| loose  | 800  | 0,3-1,0                          |          |             |       | ca.26  | 325<br>325<br>450-51  | 4,3<br>4,9-5,0<br>0=2,0                    | 350<br>500<br>1050 | 11,2-11,3<br>10,8-10,9<br>10,8-10,9                    |
| ca. 63 | 9,8<br>4,0<br>0,3-1,                         | 1090-1100<br>1130-1160<br>7 1300 |          |             |       |  |                       |  |                    |  |

The numbers denote the sequence of the tests

# C. Settings for Fuel Injection Pump with Fitted Governor

|                             | II-load stop                              | Rotational Speed limital Sa Fuel delivery characteristics |         |                  | Starting t | uel delivery 5        | 1dle stop |                   |  |
|-----------------------------|---|---|---------|------------------|------------|-----------------------|-----------|-------------------|--|
| Test oil te<br>rev min<br>1 | emp 40°C (104 F)<br>cm*/1000 strokes<br>2 | Note changed to 1 rev/min 3                               | rev/min | cm·/1000 strokes | rev/min    | cm·/1000 strokes<br>7 |           | travel<br>mm<br>9 |  |
| 1020                        | 86,5-88,5<br>(84,5-90,5)                  | 1090-1100*  |         |                  | 325        | 10,0-14,<br>(7,5-16,  |           | 4,9-5,            |  |
|                             |   |   |         |                  | 100        | min.140<br>(137)      |           |                   |  |
|                             |   |   |         |                  |            |                       |           |                   |  |

Checking values in brackets

\* 1 mm less control rod travel than col 2

BOSCH

Geschaftsbereich KH. Kundendienst. Kfz Ausrustung. 1980 by Robert Bosch GmbH. Postfach 50. D-7000 Sluttgart 1. Printed in the Federal Republic of German, Imprime en Republique Federale d. Alternagne par Robert Bosch GmbH.

# Test Specifications Fuel Injection Pumps ① and Governors

WPP 001/4 FIA 8,1 c 2

5. Edition

Testoil-ISO 4113

PES 6 MW 100/720 RS 1012 RQV 300-1100 MW 19 Komb. 0 403 446 114 supersedes 82 Fiat company 8365.25.500

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

| Port closing at pres       | stroke (                         | 2,85-3,05)   | mm (from BDC)                                       | RW = 9                           | 0 - 12,0 mm                      |  |
|----------------------------|----------------------------------|--|---|----------------------------------|----------------------------------|--|
| Rotational speed rev/min 1 | Control rod<br>travel<br>mm<br>2 | Fuel delivery<br>cm <sup>3</sup> /100 strokes<br>3 | Difference<br>cm <sup>3</sup> /<br>100 strokes<br>4 | Control rod<br>travel<br>mm<br>2 | Fuel delivery  cm³/100 strokes 3 | Spring pre-tensioning<br>(torque-control valve)<br>mm<br>6 |
| 1100                       | 11,5 <sup>+0</sup> ,1            | 9,6 - 9,8  | ),35(0,6)   |                                  |                                  |  |
| 300<br>700<br>500          | 6,3-6,6<br>12,4-12<br>11,2-11    |  | 0,35(0,55<br>0,5 (0,7)<br>0,35(0,6)                 | )                                |                                  |  |

Adjust the fuel delivery from each outlet according to the values in

#### **B. Governor Settings**

| Upper rated s       | speed              |                        | Intermediate         | rated sp | 1                     | Lower rated          | speed               | Slidings                       | Sliding sleeve travel |     |
|---------------------|--------------------|------------------------|----------------------|----------|-----------------------|----------------------|---------------------|--------------------------------|-----------------------|-----|
| deflection          | rev/min<br>Control | Control rod ta         | Degree of deflection |          | Control rod<br>travel | Degree of deflection |                     | Control rod<br>travel          |                       | . ① |
| of control<br>lever | rod travel         | mm<br>rev/min 28       | of control<br>lever  | rev/min  | mm (4)                | of control<br>lever  | rev/min             | mm (3                          | rev/min               | mm  |
| 1                   | 2                  | 3                      | 4                    | 5        | 6                     | 7                    | 8                   | 9                              | 10                    | 11  |
| max.                | 1100<br>1300       | 15,2-17,8<br>0 - 1,0   |                      |          |                       | ca.14                | 100<br>300<br>385-4 | min.8,0<br>6,3-6,4<br>45 = 2,0 |                       |     |
| ca.49               |                    | 1140-1150<br>1185-1215 |                      |          |                       | 39                   |                     |                                |                       |     |

Torque control travel a =

mr

# C. Settings for Fuel Injection Pump with Fitted Governor

| Full-load di<br>Control-roe<br>Test oil ten |  | Imitation<br>Intermediate speed | high idle s              | rery characteristics 5a speed 5b   | Starting<br>Idle<br>switchin | , •                           | Torque-<br>travel | Control od           |
|---|--|---------------------------------|--------------------------|--|------------------------------|-------------------------------|-------------------|----------------------|
| rev/min                                     | cín³/1000 strokes                        | rev/min 48                      | rev/min                  | cm <sup>3</sup> /1000 strokes  | rev/min                      | cm <sup>3</sup> /1000 strokes | rev/min           |                      |
| 1   | 2  | 3                               | 4                        | 5  | 6                            | 7                             | 8                 | 9                    |
| LDA<br>1100                                 | 0,7 bar<br>96,0 - 98,0<br>(94,0 - 100,0) | 1140-1150*                      | LDA<br>700<br>LDA<br>500 | 0,7 bar<br>101,0-105,0<br>( 99,0-107,0)<br>0 bar<br>75,0- 77,0<br>(73,0- 78,0) | 300                          |                               |                   | 12,4+0,1<br>11,5+0,1 |

Checking values in brackets

 $^{\circ}$  1 mm less control rod travel than col. 2 8.84

Testatn =

500

rev/min decreasing pressure - in bar gauge pressure

FIA 8,1 c 2

| Pump/governor      | Setting              | Measurement          | diminution<br>Control rod travel difference |
|--------------------|----------------------|----------------------|---|
|                    | Gauge pressure = bar | Gauge pressure ≠ bar | mm (1)                                      |
| RS 1012 with MW 19 | 0,5                  |                      | 12,4 - 12,5                                 |
|                    |                      | 0,3                  | 12,1 - 12,2                                 |
|                    |                      | 0,2                  | 11,5 - 11,7                                 |
|                    |                      | 0                    | 11,2 - 11,3                                 |
|                    |                      |                      |   |
|                    |                      |                      |   |
|                    |                      |                      |   |

Notes

(1) when n =

rev/min and gauge pressure =

bar (= maximum full-load control rod travel)

Testoil-ISO 4113

# **Test Specifications** Fuel Injection Pumps 1 and Governors

WPP 001/4 RVI 8,8k2 7. Edition

(1) ±1. **Festoil-ISO** 

PES 6 MW 100/320 RS 1016 RQV 300 - 1300 MW 25-1 Komb. 0 403 446 122 1 - 5 - 3 - 6 - 2 - 4 je 60° supersedes 10.83 company. RVÍ MIDR06.02-12 engine 125 kW (170 PS)

\*Start-of-delivery mark 8° after start of delivery with control-rod travel 10.5 mm All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

(2,95-3,15) 3.00-3.10 mm (from BDC) RW 9,0-12,0 mm Port closing at prestroke Spring pre-tensioning (torque-control valve) Fuel delivery Control rod travel Rotational speed | Control rod travel Difference **Fuel delivery** 

| rev/min           | mm<br>2                        | cm <sup>3</sup> /100 strokes | 100 strokes          | mm<br>2 | cm <sup>3</sup> /100 strokes<br>3 | mm<br>6 |
|-------------------|--------------------------------|------------------------------|----------------------|---------|-----------------------------------|---------|
| 1400              | 11,1+0,1                       | 9,1-9,3                      | 0,35(0,6             |         |                                   |         |
| 300<br>900<br>500 | 6,2-6,3<br>11,1+0,1<br>9,8-9,9 |                              | 0,35(0,5<br>0,5(0,7) | 1       |                                   |         |
|                   |                                |                              |                      | <u></u> | L                                 |         |

Adjust the fuel delivery from each outlet according to the values in

#### **B.** Governor Settings

| Upper rated                                    | peed                                   |                                  | Intermediate                          | rated sp     | eed                           | Lower rated   | speed        |                               | Sliding slee  |                 |  |
|--|--|----------------------------------|---------------------------------------|--------------|-------------------------------|---|--------------|-------------------------------|---------------|-----------------|--|
| Degree of<br>deflection<br>of control<br>lever | rev/min<br>Control<br>rod travel<br>mm | Control rod travel mm rev/min 2a | Degree of deffection of control lever | rev/min<br>5 | Control rod<br>travel<br>mm 4 | Degree of<br>deflection<br>of control<br>lever<br>7 | rëv/min<br>8 | Control röd<br>travel<br>mm 3 | rev/min<br>10 | (1)<br>mm<br>11 |  |
| max.   | 1400<br>1650                           | 15,2-17,8<br>0-1,0               |                                       |              |                               | ca. 12  | 200<br>300   | max. 4,8<br>6,2-6,3           |               |                 |  |
| ca.62  |  | 1440-1450<br>1550-1580           |                                       |              |                               |   | 490-         | 550 = 2,0                     |               |                 |  |
|  |  |                                  |                                       |              |                               | 39  |              |                               |               |                 |  |

Torque control travel a =

mm

# C. Settings for Fuel Injection Pump with Fitted Governor

| Control-ro  | of rod stop<br>bit temp 40°C (104°F) 2 limitation<br>intermediate speed |            | (30)       |                                     | switchir | . 0                        | Torque-control 5 travel  Control rod travel rev/min mm |   |
|-------------|---|------------|------------|-------------------------------------|----------|----------------------------|--|---|
| 1           | 2   | 3          | 4          | 5                                   | 6        | 7                          | 8  | 9 |
| LUA<br>1400 | 0,5 bar<br>91,0-93,0<br>(89,0-95,0)                                     | 1440-1450* | LUA<br>900 | 0,5 bar<br>88,5-92,5<br>(86,5-94,5) | 100      | 94,0-104,0<br>(91,0-107,0) |  |   |
|             |   |            | LDA<br>500 | 0 bar<br>59,0-61,0<br>(57,0-63,0)   | 100-     | 230 (80-250)               |  |   |

Checking values in brackets

\* 1 mm less control rod travel than col 2

8.84

# D. Adjustment Test for Manifold Pressure Compensator

| Pump/governor | assemble to the control of | Setting            | Measurement        | diminution Control rod travel difference |
|---------------|----------------------------|--------------------|--------------------|--|
|               |                            | Gauge pressure bar | Gauge pressure bar | mm (1)                                   |
| RS 1016 +     |                            | 0,25               | -8 +               | 10,8 - 10,9                              |
| MW 25-1       |                            |                    | 0,5                | 11,1 - 11,2                              |
|               |                            |                    | 0,2                | 10,3 - 10,4                              |
|               |                            |                    | 0                  | 10,1 - 10,2                              |

Notes

(1) when n

rev/min and gauge pressure

bar ( maximum full-load control rod travel)

# Test Specifications Fuel Injection Pumps 1 and Governors

WPP 001/4 VOL 4,5 f

1. Edition

Testoil-ISO 4:13

PES 4 MW 100/320 RS 1102

ROV 300-1100 MW 39-4

supersedes

0 403 444 106

comparVolvo engine D 45

82,5 kW

1-3 - 4 - 2

 $0-90-180-270 \pm 0.50 (0.75)$ 

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

## A. Fuel Injection Pump Settings

Port closing at prestroke (2,80-2,90 (2,75-2,95)

mm (from BDC) RW = 9,0-12,0 mm

| Rotational speed rev/min |          | Fuel delivery  cm <sup>3</sup> /100 strokes 3 | Difference<br>cm³/<br>100 strokes<br>4 | Control rod<br>travel<br>mm<br>2 | Fuel delivery<br>cm <sup>3</sup> /100 strokes<br>3 | Spring pre-tensioning<br>(torque-control valve)<br>mm<br>6 |
|--------------------------|----------|---|--|----------------------------------|--|--|
| 700                      | 10,2+0,1 | 9,4-9,6                                       | 0,35 (0,6                              | )                                |  |  |
| 300                      | 4,9-5,0  | 1,3-1,7                                       | 0,35 (0,5                              | 5)                               |  |  |
| 1000                     | 10,2+0,1 |   | 0,55 (0,7                              | b                                |  |  |
|                          |          |   |  |                                  |  |  |

Adjust the fuel delivery from each outlet according to the values in

#### **B.** Governor Settings

| Upper rated s | peed  |                                     | Intermediate | rated sp     | •                             | Lower rated   | speed        |                               | Stiding steeve trav |          |  |
|---------------|---|-------------------------------------|--------------|--------------|-------------------------------|---|--------------|-------------------------------|---------------------|----------|--|
| deflection    | rev/min<br>Control<br>rod travel<br>mm<br>2 | Control rod ta travel mm rev/min 28 | of control   | rev/min<br>5 | Control rod<br>travel<br>mm 4 | Degree of<br>deflection<br>of control<br>lever<br>7 | rev/min<br>B | Control rod<br>travel<br>mm 3 | rev/min<br>10       | mm<br>11 |  |
| max.          | 1200<br>1350                                | 15,2-17,8<br>0 - 1,0                |              |              |                               | ca.12   | 300<br>100   | 4,9-5,0<br>min. 8,1           |                     |          |  |
| ca. 48        | 9,2<br>4,0                                  | 1140-1150<br>1190-1220              | •            | *            |                               |   | 320-         | 650                           |                     |          |  |
|               |   |                                     |              |              |                               | 39  |              |                               |                     |          |  |

Torque control travel a =

mm

# C. Settings for Fuel Injection Pump with Fitted Governor

| Full-load d<br>Control-ro<br>Test oil ten | d stop<br>np 40°C (104°F) 2 | imitation intermediate speed | (30)    |                               | awitchir | ng point  | travel  | Control roc<br>travel |
|---|-----------------------------|------------------------------|---------|-------------------------------|----------|---|---------|-----------------------|
| rev/min                                   | cm³/1000 strokes            | rev/min                      | rev/min | cm <sup>3</sup> /1000 strokes | rev/min  | cm <sup>3</sup> /1000 strokes   | rev/min | mm<br>9               |
| 700                                       | 94,0-96,0<br>(92,0-98,0)    | 1140-1150*                   | 1000    | 96,5-99,5<br>(95,0-101,0)     | 300      | 19,0-21,0<br>mm RW<br>130,0-140,0<br>127,0-143,0)<br>13,0-17,0<br>(10,5-19,5)<br>220 (80-250) |         |                       |

Checking values in brackets

\* 1 mm less control rod travel than col 2

7.84